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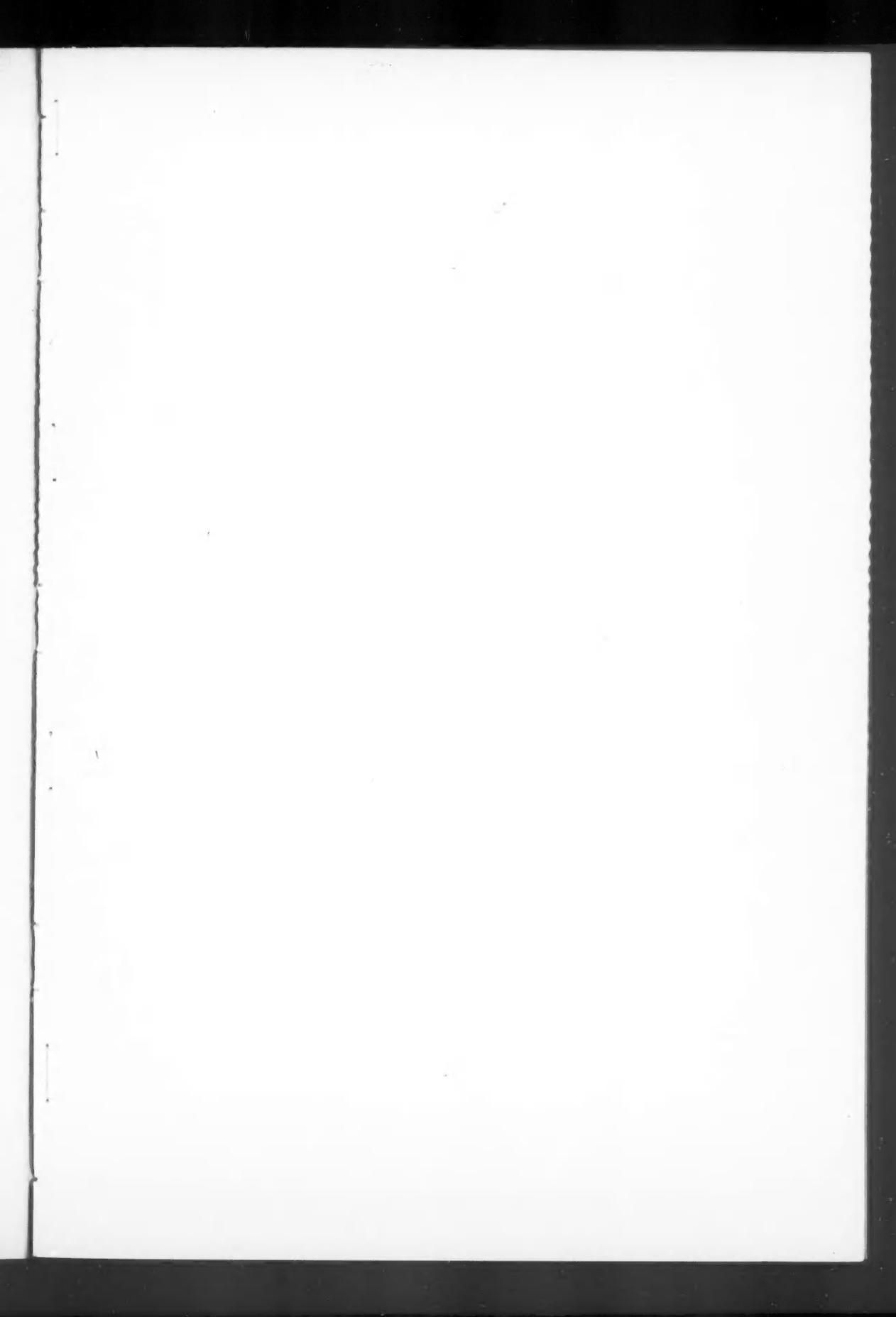
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PIED-BILLED GREBE
Painting by Allan Brooks

THE CONDOR

VOLUME 50

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NESTING BIRDS OF THE BLACK FOREST, COLORADO

By LOUISE HERING

The Black Forest is a yellow pine forest that covers part of the region of the Arkansas-Platte divide, between Denver and Colorado Springs, in central Colorado. This timbered area of about 150,000 acres is an eastward extension of the foothill or Transition Life-zone (6000-8500 feet) of the Front Range of the Rocky Mountains, and although the topography is rolling, the elevation is nearly uniform. The Black Forest is interesting biologically because it is composed of a nearly pure stand of climax western yellow pine (*Pinus ponderosa scopulorum*) and because its position is intermediate between the eastern plains and the higher altitudes of the mountains to the west.

The purpose of the investigation here reported was to make a quantitative study of the bird life in the Black Forest in the 1945 nesting season. As far as is known, only one thorough census of a breeding-bird population in a coniferous forest of this type has been taken previously in North America. Cooke (1916) worked in a yellow pine and shrub oak habitat near Flagstaff, Arizona. Among semi-quantitative studies made in various western yellow pine forests, perhaps the most valuable for purposes of comparison is Rasmussen's survey (1941) on the Kaibab Plateau, Arizona.

On the basis of ten-year averages of climatological data from the U. S. Weather Bureau station at Monument, Colorado, the annual mean temperature of the Black Forest is 45.7°F., the annual precipitation is 19.4 inches, and the annual snowfall is about seventy-five inches. The greatest amount of moisture is recorded in the spring and summer months in this region. May, June, July, and August, 1945, were unusually damp, with occasional hailstorms (Hering, 1947a).

Shaddle (MS) and Williams and Holch (1946) have carried out research in plant ecology in the Black Forest. Cary (1911) and Aiken and Warren (1914) did pioneer ornithological field work in this part of Colorado, and Sclater's book (1912) was based largely on specimens collected in the same general region. Observations on the distribution of nesting birds in relation to altitudinal life zones in Colorado have been made by Betts (1913), Alexander (1937), Johnston (1943), and others.

Since about 1900, students of ornithology and animal ecology have realized the value of exact field reports on the abundance of species in various habitats. I used suggestions made by Hickey (1943) and Kendeigh (1944), both of whom describe methods of population study. Forests located in rather arid climates (Colorado) and composed of a single conifer usually do not sustain large or varied bird populations; but relatively few data are available from such areas.

The census was taken about fifteen miles northeast of Colorado Springs, in the heavily wooded portion of the Black Forest, on "La Foret," an estate now used as a summer camp. While the greater part of the Forest had been cut over, the timber on this property was at that time largely undisturbed, and many large old pines remained.

Seventy-five acres, in the form of a rectangle one-quarter mile wide and about one-half mile long, and having an elevation of between 7200 and 7300 feet, were chosen so that a creek ran across the northern portion of the plot. Along the wide, sandy creek bottom and slopes leading from the creek were willows three to ten feet tall and young aspens. On dryer ground on either side were a few patches of alder, chokecherry, shrub oak, mountain mahogany, wild rose, and wild raspberry bushes. The forest was composed of pines ranging in size from small seedlings to large trees thirty-five to fifty feet high (fig. 12), and the forest floor was covered with pine needles and cones, grasses,



Fig. 12. General view of the Black Forest, central Colorado.

blossoming herbs, kinnikinnic, and a few juniper bushes. There were few stumps or logs. The largest open area was a meadow in the southern half of the tract which covered about four acres (fig. 13). This, and other smaller meadows within the area, were made up of grasses, wild flowers, and a few willows.

The most conspicuous small mammals on the acreage were the tufted-eared squirrels (*Sciurus aberti*). One deer was observed. Several horses, pastured on "La Foret," grazed in the meadows and occasionally trampled the bushes near the creek. Human disturbance was confined to the campers coming to the two buildings on the plot from the central camp east of and outside the acreage boundaries.

The "plot census" was used in the investigation. This is the most dependable of the various methods of censusing bird populations because the observer makes repeated visits to the same area and becomes familiar with the birds in their local environment. A total of 162 hours was spent in the field. Weather permitting, the seventy-five acres could be covered in a day; one portion was usually studied in a morning field trip, and another in the afternoon.

The original map of the plot was constructed by pacing off critical distances with the use of a compass, and this was later compared with an aerial photograph. All birds—residents, visitants, and migrants—were recorded on one mimeographed copy of the map during each field trip, and additional comments were written in notebooks. Nests, when found, were given exact locations by pacing the distances from landmarks, and the

heights of nests and trees were obtained with an Abney hand level. Field work done in 1945 extended over the following periods: May 21 to May 26, June 2 to June 30, and August 10 to August 12, all dates inclusive.

ACKNOWLEDGEMENTS

The author is greatly indebted to Mr. Melvin Dorsett, Director of La Foret Camps, for permission to conduct field studies on that property. Dr. Gordon Alexander, of the Biology Department at the University of Colorado, gave advice on the problems of this investigation and provided photographs used herein. I also wish to thank the following persons for their assistance: C. R. Van Doren, Ralph Ayer, Caroline M. Shields, and



Fig. 13. View of a 4-acre meadow in the southern half of the study-plot.

E. E. Ericson. Acknowledgement is also made of a grant from the Maud Gardiner Odell Summer Scholarship in Biology, University of Colorado.

NESTING OBSERVATIONS

Twenty species nested within the seventy-five acres of yellow pine forest and creek environment chosen for the census. The following list gives these species in the order of abundance of nesting pairs (the figures in the right column are the total numbers of nesting pairs on the plot):

Robin (<i>Turdus migratorius</i>)	9
Western Bluebird (<i>Sialia mexicana</i>)	7
Western Wood Pewee (<i>Contopus richardsonii</i>)	6
Gray-headed Junco (<i>Junco caniceps</i>)	5
Chipping Sparrow (<i>Spizella passerina</i>)	5
Violet-green Swallow (<i>Tachycineta thalassina</i>)	4
Pygmy Nuthatch (<i>Sitta pygmaea</i>)	4
Audubon Warbler (<i>Dendroica auduboni</i>)	4
Mourning Dove (<i>Zenaidura macroura</i>)	3
Red-shafted Flicker (<i>Colaptes cafer</i>)	3
House Wren (<i>Troglodytes aedon</i>)	3
Solitary Vireo (<i>Vireo solitarius</i>)	3
Green-tailed Towhee (<i>Chlorura chlorura</i>)	3
Broad-tailed Hummingbird (<i>Selasphorus platycercus</i>)	2
White-breasted Nuthatch (<i>Sitta carolinensis</i>)	2

Warbling Vireo (<i>Vireo gilvus</i>)	2
Yellow Warbler (<i>Dendroica aestiva</i>)	2
Pine Siskin (<i>Spinus pinus</i>)	2
Arkansas Goldfinch (<i>Spinus psaltria</i>)	2
Yellow-throat (<i>Geothlypis trichas</i>)	1

Creek environment.—Four of the twenty nesting species remained in the creek environment during the breeding season and used the deciduous foliage for nesting sites: Warbling Vireo, Yellow Warbler, Yellow-throat, and Green-tailed Towhee. Eight nests (fig. 14) were attributed to these birds, and pairs of each species were well separated along the length of the creek. One nest of the Warbling Vireo was six feet above the

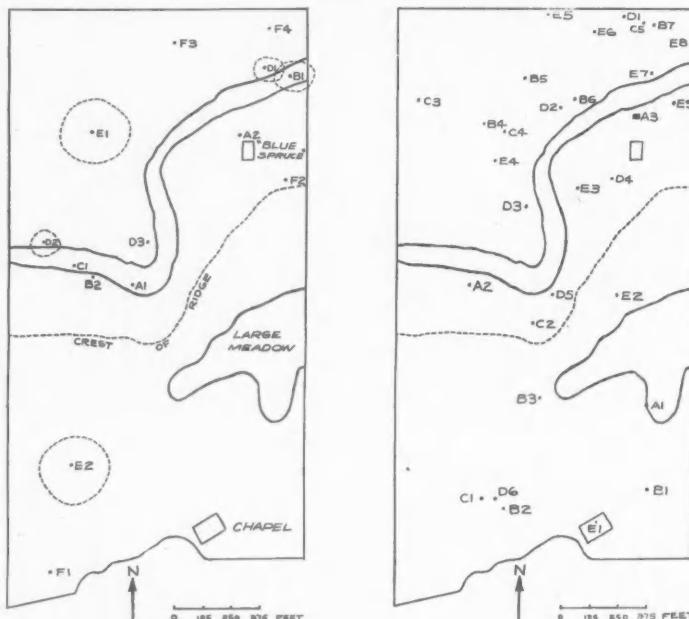


Fig. 14 (left). Distribution of nests on study-plot: A1, A2, Warbling Vireo; B1, B2, Yellow Warbler; C1, Yellow-throat; D1-D3, Green-tailed Towhee; E1, E2, White-breasted Nuthatch; F1-F4, Pygmy Nuthatch.

Fig. 15 (right). Same as preceding: A1, A2, Broad-tailed Hummingbird; A3, perch of male hummingbird; B1-B7, Western Bluebird; C1-C5, Chipping Sparrow; D1-D6, Western Wood Pewee; E1-E8, Robin.

creek bed in a willow bush (*Salix exigua*), and the second was suspended from a branch of a small aspen, about six feet from the ground. One pair of Yellow Warblers whose nest was saddled between five vertical willow branches about two feet from the ground occupied a territorial area of 0.4 acre (fig. 14), and the male defended the territory against a persistent male intruder during the first two weeks in June. The other nest of the Yellow Warbler was never found; neither was the nest of the Yellow-throat, nor the three nests of the towhee. By the behavior of the parent birds, these nests were judged to be hidden in low sites in the creek bushes. Two of the three pairs of Green-tailed Towhees held territories (fig. 14) which the males announced by repeated singing from

perches overlooking the areas. The first pair had an area of 0.4 acre, and the second pair, an area of 0.2 acre.

A male Broad-tailed Hummingbird was seen repeatedly on a perch overlooking the creek near the plot's eastern boundary (fig. 15), the perch being a twig on a dead pine branch about twenty feet from the ground. At intervals, he flew over the creek foliage and then returned to the tree.

Pine interiors.—Six nesting species used only the interiors of old pines for nesting locations: Flicker, Violet-green Swallow, White-breasted Nuthatch, Pygmy Nuthatch, House Wren, and Western Bluebird. Twenty-three breeding pairs of these species were counted. The nests of the House Wren were in pines along the creek banks and were located at an average height of 8.7 feet from the ground. All other species were distributed throughout the forest. Several trees housed more than one nesting species: five pairs utilized five holes on the south side of an old pine in the northeast corner of the acreage (one pair of Flickers, two pairs of swallows, one pair of Pygmy Nuthatches, and one pair of bluebirds). The two pairs of White-breasted Nuthatches were far separated (fig. 14) and had large foraging territories (2.3 acres and 1.7 acres). Of Pygmy Nuthatches (fig. 14) there was one pair per 18.8 acres, and their nesting holes varied from twelve to thirty feet in height, with an average height of 17.5 feet from the ground. The nests of the Western Bluebird (fig. 15) were in old pines at heights varying from nine to thirty-two feet, with an average distance of 15.7 feet above the ground. The bluebirds were quiet residents of the forest, but were seen on several occasions to attack tufted-eared squirrels, to quarrel amongst themselves, and, once, to attack a pair of Western Tanagers. Two or more pairs of bluebirds fed in the large meadow. They remained near the edges, and alternately perched on low branches and fed amidst the grass.

Pine foliage.—Eight of the twenty breeding species constructed their nests in the foliage of the pines. These were Broad-tailed Hummingbird, Western Wood Pewee, Robin, Solitary Vireo, Audubon Warbler, Pine Siskin, Green-backed Goldfinch, and Chipping Sparrow. Thirty-six nests in the foliage of pines were counted, and one nest was on the rafters on the outside of a building (Robin). Interesting courtship behavior of the hummingbirds was noted near the creek during May and the first two weeks in June (Hering, 1947b). These birds fed from the creek blossoms, and later, from forest flowers, such as penstemons and wild iris. One hummingbird nest (fig. 15) was in a tall pine at the edge of the large meadow, on a dead limb fifteen feet from the ground. The nest was about two feet from the trunk of the tree and was protected by a limb directly over it. The second nest was in a smaller pine near the creek, on a limb ten feet from the ground, and was constructed about eighteen inches out on the lower part of a Y-shaped limb. Many hummingbirds were seen along the creek in August. The male pewees remained in small clearings around their nesting sites, although the six nests of the Wood Pewee were widely distributed throughout the plot (fig. 15). The population density of this species was one pair per 12.5 acres. Six Robin nests (fig. 15) were located in close relationship to each other in the northeast portion of the plot. The other three nests were separated from nests of the same species by relatively long distances. The Robins flew both short and long distances from the nesting sites to feed, which probably indicates a complex territorial arrangement. Several pairs fed in the large meadow. A great many Robin fledglings were seen in the creek environment after they had left the nests. The nests were uniformly well-supported and varied in height from 6.5 to 17 feet, with an average height of 10.5 feet from the ground. The Solitary Vireos constructed their nests in low branches of small pines; the Chipping Sparrows built at medium heights in larger pines; and the goldfinches, as far as is known, in tall pines. The density of Chipping Sparrows (fig. 15) was one pair per fifteen acres.

For the purpose of testing possible operation of "edge effect" within the study plot, the acreage might be divided into three types of habitats: the open forest, the clearing or meadow within the forest, and the deciduous foliage of the creek. Many of the breeding birds used more than one of these habitats. Several nests were constructed in pines along forest clearings or meadows (three of pewee, two of Chipping Sparrow, one of hummingbird, one of Robin, one of Pine Siskin, one of goldfinch, and one of Audubon Warbler). Several pairs nested in pines along the creek (three of House Wren, three of Audubon Warbler, four of Robin, and one of hummingbird). One species, the Green-tailed Towhee, nested in the creek environment, but used nearby pines for singing perches. Eight of the nesting species were observed while drinking from the creek (Robin, Mourning Dove, Flicker, Pine Siskin, Broad-tailed Hummingbird, Wood Pewee, Western Bluebird, and Solitary Vireo), and six species were seen bathing in the creek (Robin, siskin, junco, Audubon Warbler, towhee, Chipping Sparrow, and Pygmy Nuthatch).

Ground sites.—Two pairs of Mourning Doves nested in tall pines, while the nest of another was on the ground, beneath bushes. One species, the Gray-headed Junco, nested entirely on the ground; two nests of this species were on creek banks and the other three were in the forest. One nest, discovered on June 17, when the three young were nearly able to leave the nest, was on the ground beneath a twenty-inch pine seedling. Three pairs of juncos were far separated on the tract, while two breeding pairs remained near each other throughout the season. The males of the latter two pairs sang rather often, but both families fed on the forest floor without any apparent territorial conflict.

REGULAR VISITORS ON THE STUDY-PLOT

Eight species did not nest on the tract but were regular visitors during the breeding season. These species, with the number of individuals given to the right, were as follows:

Killdeer (<i>Oxyechus vociferus</i>)	2
Nighthawk (<i>Chordeiles minor</i>)	3
Red-naped Sapsucker (<i>Sphyrapicus varius</i>)	2
Olive-sided Flycatcher (<i>Nuttallornis borealis</i>)	1
Steller Jay (<i>Cyanocitta stelleri</i>)	4
Mountain Chickadee (<i>Penthestes gambeli</i>)	1
Black-headed Grosbeak (<i>Pheucticus melanocephalus</i>)	2
Spotted Towhee (<i>Pipilo maculatus</i>)	1

The Killdeers were believed to be nesting near the edge of a wide sandy creek bed south of the plot. A large aspen tree in a grove east of the plot was the nesting site of the sapsuckers. The Olive-sided Flycatcher remained near an arroyo at the southwest corner of the acreage, but it may have been unmated. The Steller Jays attempted to raid the nests of various smaller birds several times, and one pair was seen bathing leisurely in the creek. The Mountain Chickadee fed in the pines in the southeast corner. The grosbeaks and the Spotted Towhee probably nested in bushes in the aspen grove east of the acreage, but their nests were never found.

In addition to these, regular visitors representing five of the nesting species were as follows: Violet-green Swallow, 2; Pygmy Nuthatch, 2; Western Bluebird, 6; Solitary Vireo, 2; and Green-tailed Towhee, 2. The number of regular visitors on the study-plot totals thirty.

TOTAL POPULATION

In summary, forty-two nests were actually found on the seventy-five acres, and thirty additional nests were each sufficiently verified to be included in the present census. The breeding population thus totals seventy-two pairs per seventy-five acres. These 144 birds plus the 30 regular visitors yield a total population of 174 adults. Expressed in the standard form, this would be 232 adults per hundred acres.

OTHER SPECIES

Four species that were believed to nest elsewhere in the Black Forest were seen on the plot occasionally. The nesting evidence for the Hairy Woodpecker (*Dendrocopos villosus*) and the Black-capped Chickadee (*Parus atricapillus*) was that members of these species were observed, on and off the plot, all through the breeding season. Nesting sites of the Brewer Blackbird (*Euphagus cyanocephalus*) and the House Finch (*Carpodacus mexicanus*) were seen outside the plot.

Four species were never seen on the acreage, but were observed nesting elsewhere in the Black Forest: Downy Woodpecker (*Dendrocopos pubescens*), Mountain Bluebird (*Sialia currucoides*), Common Red-wing (*Agelaius phoeniceus*), and Song Sparrow (*Melospiza melodia*). No Mountain Bluebirds were found in the uninhabited forest, but this species was seen frequently near farm buildings and residences, nesting in bird boxes, and between the rafters in garages and other structures. One breeding pair had constructed its nest between the rafters supporting a large water tank, and the parents flew through the overflow stream of water to feed the young birds.

Fifteen species of birds infrequently seen on the study tract, and whose status in the Black Forest was not determined, are as follows:

Cooper Hawk (*Accipiter cooperii*), Red-tailed Hawk (*Buteo borealis*), Swainson Hawk (*Buteo swainsoni*), Marsh Hawk (*Circus cyaneus*), Sparrow Hawk (*Falco sparverius*), Crow (*Corvus brachyrhynchos*), Creeper (*Certhia familiaris*), Townsend Solitaire (*Myadestes townsendi*), Calaveras Warbler (*Vermivora ruficapilla*), Virginia Warbler (*Vermivora virginiae*), Western Tanager (*Piranga ludoviciana*), Lazuli Bunting (*Passerina amoena*), Evening Grosbeak (*Hesperiphona vespertina*), Cassin Purple Finch (*Carpodacus cassini*), and Common Goldfinch (*Spinus tristis*).

DISCUSSION

In regard to the altitudinal position of the nesting birds, sixteen of the species are found commonly in the Transition Life-zone in Colorado, but four are generally considered summer residents of either higher or lower elevations. Betts (1913) listed the breeding birds of Colorado according to altitudinal distribution. He considered the Yellow-throat and the Green-backed Goldfinch to be characteristic breeding birds of the Plains (Upper Sonoran) Zone (below 6000 feet). Both of these nested on the acreage (7200-7300 feet). Betts listed the Audubon Warbler only under the Mountain (Boreal) Zone (8500-11,500 feet); four pairs of this species nested on the plot. He states that the Gray-headed Junco is found in the Transition Zone, but is a characteristic breeding bird in the Mountain Zone. Five nesting pairs of these juncos were found on the study area. The Olive-sided Flycatcher, a regular visitor on the acreage, is, according to Betts, a characteristic breeding species of the Mountain Zone.

Cooke (1916) took a census on a seventy-acre tract of yellow pine and Gambel shrub oak at 7100 feet, near Flagstaff, Arizona. He found a population of thirty-one breeding pairs of eighteen species. In the standard form, this would be eighty-nine adult birds per hundred acres, as compared with the 232 adults of twenty species found in the Black Forest. Details of his survey were not published, but it is possible that the absence of a creek, and perhaps the lack of moist ground (essential for Robins) could explain this difference in densities. However, the shrub oak theoretically should have broken the monotony of the conifer habitat to offset somewhat the absence of water.

Rasmussen (1941) made a semi-quantitative survey in the yellow pine and aspen forest on the Kaibab Plateau, at an elevation of 6800-8200 feet. The forest had little understory and was composed of pines up to more than one hundred feet high. Rasmussen found the most abundant resident birds to be Pygmy Nuthatch (most uniformly distributed), Steller Jay, Sharp-shinned Hawk, White-breasted Nuthatch, Mountain Chickadee, Cassin Purple Finch, Red-shafted Flicker, Red-backed Junco, Goshawk,

and Red-tailed Hawk. Birds present in the summer, or at least most evident then, were Western Bluebird (most characteristic), Audubon Warbler (most abundant), Williamson Sapsucker (in aspens), Chipping Sparrow, Horned Owl, and Band-tailed Pigeon (uncommon). Noticeably absent from Rasmussen's report, as compared with the Black Forest, were Mourning Doves and goldfinches. However, Rasmussen found the nest of a Lewis Woodpecker (*Asyndesmus lewis*), a species not seen in the Black Forest. He also considered the Cassin Purple Finch as common during the breeding season, and this species did not nest on the Colorado study area.

SUMMARY

A survey of the 1945 nesting population of the Black Forest, in central Colorado, was made by taking a census on seventy-five acres of undisturbed western yellow pines, located at 7200-7300 feet, in the Transition Life-zone.

Forests composed of a single conifer usually do not support a large or varied bird fauna, but seventy-two breeding pairs of twenty species were counted on the plot censused in this study. These, plus thirty regular visitors, gave a total population of 174 adult birds, or a density of 232 per one hundred acres. A willow-bordered creek in the Black Forest tract was possibly responsible for the high density found.

Sixteen species present in the Black Forest are typical of the Transition Life-zone in Colorado. Four others, found nesting on the study area, are considered by others to be characteristic of lower or higher zones in Colorado. Sixteen species not recorded on the study area nested elsewhere in the Black Forest, and an additional fifteen species were seen infrequently. A total of fifty-one species was recorded in the Black Forest.

LITERATURE CITED

Aiken, C. E. H., and Warren, E. R.
1914. The birds of El Paso County, Colorado. Colo. Coll. Publ., Science Ser., 12:455-603.

Alexander, G.
1937. The birds of Boulder County, Colorado. Univ. Colo. Studies, 24:79-105.

Betts, N. deW.
1913. Birds of Boulder County, Colorado. Univ. Colo. Studies, 10:177-232.

Cary, M.
1911. A biological survey of Colorado. N. Amer. Fauna, 33:1-256.

Cooke, W. W.
1916. Second annual report of bird counts in the United States, with discussion of results. U. S. D. A. Bull. 396, 20 pp.

Hering, L.
1947a. Effects of a hailstorm in the Black Forest, Colorado. Condor, 49:87-88.
1947b. Courtship and mating of broad-tailed hummingbird in Colorado. Condor, 49:126.

Hickey, J. J.
1943. A guide to bird watching (New York, Oxford University Press), xiv+262 pp.

Johnston, V. R.
1943. An ecological study of nesting birds in the vicinity of Boulder, Colorado, Condor, 45:61-68.

Kendeigh, S. C.
1944. Measurement of bird populations. Ecol. Mono., 14:67-106.

Rasmussen, D. I.
1941. Biotic communities of the Kaibab Plateau, Arizona. Ecol. Mono., 11:229-275.

Sclater, W. L.
1912. A history of the birds of Colorado (London, Witherby and Co.), xxiv+576 pp.

Williams, T. E., and Holch, A. E.
1946. Ecology of the Black Forest of Colorado. Ecology, 27:139-149.

University of Colorado, Boulder, Colorado, November 10, 1947.

RECORDS OF FRINGILLIDS FROM THE PLEISTOCENE OF RANCHO LA BREA

By WILLIAM R. DAWSON

The question of what species of the family Fringillidae are represented in the Pleistocene of Rancho La Brea is one that has not been easy to answer. The small size and remarkable uniformity of skeletal structure within this family make identification difficult. A. H. Miller (Univ. Calif. Bull. Dept. Geol. Sci., 19, 1929:15), having chiefly limb elements and a sternum at his disposal, was forced to list the fringillid remains from Rancho La Brea under the heading "Indeterminate Sparrows" because their nature defied identification. Later, availability of a few fringillid upper mandibles from the asphalt deposits enabled Sibley (Condor, 41, 1939:126-127) to identify *Spinus*, *Amphispiza* and *Spizella* on the basis of distinguishing characters peculiar to this element. The utilization of the upper mandible was obviously the key to the identification of members of this family.

Only recently, however, have any further specimens of fringillid mandibles from Rancho La Brea come to light. Pierce (Bull. So. Calif. Acad. Sci., 16, 1946:113-119) in perfecting a method of obtaining remains of Arthropoda from the asphalt deposits, was able at the same time to recover numerous fragile vertebrate specimens, including upper and lower mandibles of passerine birds. Of these, 66 from Los Angeles Museum Pit "A" proved to be those of fringillids (49 upper, 17 lower mandibles). It is from these specimens that the present work was developed, the emphasis being upon identification of the upper mandibles.

I am indebted to Dr. Alden H. Miller and Mr. Charles Sibley of the Museum of Vertebrate Zoology, and to Mr. A. J. van Rossem, Curator of the Dickey Collections, University of California at Los Angeles, for their generous loan of skeletons of modern fringillids and for valuable data. At the Los Angeles Museum, Mr. Kenneth Stager, Curator of Ornithology, has kindly provided skins for measurements, and Mr. Lewis Athon has prepared the photographs. My debt to Dr. Hildegard Howard, Curator of Avian Paleontology, is great. Without her generous permission to use all the facilities of her department in the museum, this paper could not have been undertaken; without her encouragement, guidance, and helpful criticism, it could not have been completed.

The identification of any bones as small as those of the Fringillidae introduces special problems. Measurements at best prove to be approximate and are of value in deciding between species in only a few genera. After scrutiny of upper mandibles of modern fringillids, certain characters appear of value in separation of the genera, and the minor variations in these same characters are, in some cases, helpful in species differentiation. These are characters connected with the palatal surface of the premaxilla, the shape and location of the nostrils, and the profile of the internarial bridge.

In the Fringillidae the palatal surface conforms to a certain basic pattern which has almost as many modifications as there are genera. In the typical fringillid, this area has a groove running longitudinally down its center. This is herein referred to as the central groove. The ridge through the center of this groove is termed the central ridge; the lateral walls of the groove, the secondary ridges. Lateral to the secondary ridges and just within the outer margins of the palate are depressions, one on each side, the secondary grooves.

The nostrils in the Fringillidae are of two basic types: those which open more dorsad than laterad and those which open more laterad than dorsad. Of these, the dorsad group are always nearly round, and the laterad group are in most instances elongate. These

characters seem to conform well to the present classification of the Fringillidae. The dorsad group includes the members of the subfamily Richmondeninae; the laterad group encompasses the subfamily Emberizinae. The members of the subfamily Carduelinae appear to resemble the Richmondeninae more closely than the Emberizinae.

The profile of the internal bridge is of importance in some genera. It ranges from an almost straight line to a line with a sharp angle, the angle occurring usually at the center of the bridge.

These are the characters, in the main, upon which the identification of the fossil fringillid upper mandibles were based. The lower mandibles referred to herein were identified by: (1) The shape of the symphysis and its size in relation to the entire structure, (2) the shape of the rami and the configuration of their lateral surfaces, and (3) the size and shape of the articular processes. In addition to these characters, the size, shape, and location of the foramen that appears in each ramus occasionally were of value.

The fossil mandibles under consideration represent 3 subfamilies, 11 genera, and 13 species of the Fringillidae. This adds 10 species to the list of passerines heretofore recorded from Rancho La Brea and encourages further study of these elements.

The following is the list of species of fringillids recognized in the present collection from the Rancho La Brea Pleistocene. An asterisk indicates those for the first time recorded from this locality.

Subfamily Richmondeninae	* <i>Pipilo fuscus</i>
* <i>Pheucticus melanocephalus</i>	* <i>Pooecetes gramineus</i>
Subfamily Carduelinae	* <i>Chondestes grammacus</i>
* <i>Hesperiphona vespertina</i>	<i>Amphispiza bilineata</i>
<i>Spinus tristis</i>	<i>Spizella</i> sp.
Subfamily Emberizinae	* <i>Zonotrichia leucophrys</i>
* <i>Pipilo angelensis</i> , n. sp.	* <i>Passerella iliaca</i>
* <i>Pipilo maculatus</i>	* <i>Melospiza melodia</i>

Pheucticus melanocephalus. Black-headed Grosbeak. One upper mandible; one lower mandible. The upper mandible consists of the anterior one-third of the premaxilla. Comparison of it with the heavy-billed members of the Fringillidae shows it to be identical in palatal configuration with *Pheucticus*. It differs from *Richmondena* in having sharper, more distinct secondary ridges and a deeper, narrower central groove; it is distinguished from *Hesperiphona* in having a less concave palatal surface.

Enough of the lower mandible is present so that comparison with a corresponding part of *Pheucticus melanocephalus* shows the following similarities: short rami in comparison with the symphysis, well developed median articular processes, and smooth lateral ramal surface with a small foramen.

Hesperiphona vespertina. Evening Grosbeak. One lower mandible. This specimen shows the heavy symphysis and general shape of ramus peculiar to this genus. Comparison with a specimen of the modern Evening Grosbeak, shows it to be identical in every detail.

Spinus tristis. American Goldfinch. One upper mandible; one lower mandible. The upper mandible clearly exhibits the deep central groove characteristic of *Spinus*. It closely resembles *S. psaltria* as well as *S. tristis* in the configuration of the palatal surface. Its breadth falls within the range of only the latter species, however. In addition to its size, it resembles *S. tristis* in lacking the notch in the posterior palatal border of the premaxilla which is characteristic of *S. psaltria* and other members of the genus.

	Fossil <i>Spinus</i> L. A. Mus. no. K7299	<i>S. tristis</i> M. V. Z. nos. 19719	<i>S. psaltria</i> M. V. Z. nos. 74926
Width at maxillaries in millimeters	5.3	5.5	5.3

The lower mandible resembles *Spinus* in having a symphysis which is nearly half as long as the rami. In addition, the foramen in each ramus is large. It resembles *S. pinus* and *S. tristis* in size; but in shape it resembles only *S. tristis*, the broader of the two.

Pipilo. Towhees. This genus is represented by 10 upper mandibles which may be assigned to two species. In addition, two lower mandibles indicate the presence of a third species. In all members of the genus *Pipilo* the upper mandible exhibits well defined central ridges and well marked central and secondary grooves. Only two other genera of the Emberizinae resemble it in these respects: *Chlorura* and *Junco*. *Pipilo* is distinguishable from both, however, by the presence of distinct maxillary processes extending noticeably posteriad to the inferior nasal processes.

Pipilo angelensis new species

Type.—Complete upper mandible, L. A. Mus. no. K7291; Pleistocene, Rancho La Brea, Pit "A".

Referred material.—One complete upper mandible, L. A. Mus. no. K7292, designated as cotype, and six incomplete upper mandibles listed under L. A. Mus. no. K7293.

Description of type.—Large in comparison with the towhees of today. Central groove wide, with tendency to constrict at posterior end. Secondary grooves and ridges well developed. Posteroventral surface of internarial bridge posterior to nares (that part of the premaxilla bordered by the superior nasal processes) rises abruptly and exhibits a ridge which is a continuation of the keel on the underside of the internarial bridge. Each superior nasal process exhibits a longitudinal ridge located just inside the junction of the superior and inferior nasal processes.

The upper mandible of *Pipilo angelensis* has characters in common with both *Pipilo fuscus* and *Pipilo maculatus*, the other two representatives of this genus in the Rancho La Brea Pleistocene. The posterior ventral surface of the superior end of the nasal bridge resembles that of *P. fuscus* in its sharp rise and in the presence of a center ridge. The

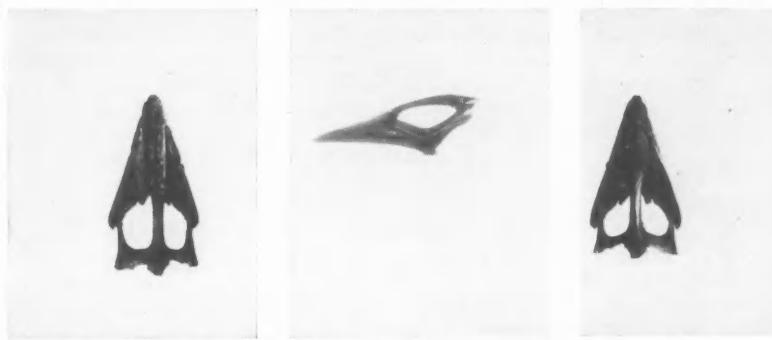


Fig. 16. Upper mandible (type) of *Pipilo angelensis* from the Pleistocene of Rancho La Brea (L. A. Mus. no. K7291). Left, palatal view; center, lateral view; right, dorsal view.

rise in *P. maculatus* is more gradual and the center ridge is absent. The lateral ridges found on the posteroventral surface of the superior nasal processes are not found in either *P. maculatus* or *P. fuscus*. The palatal surface of the premaxilla in *P. angelensis* shows the same well developed central and secondary grooves and sharp ridges as in *P. maculatus*, but its central groove is less constricted.

Comparison with *P. aberti* shows *P. angelensis* to have more distinct secondary ridges and grooves, a relatively longer and lower nostril, and a wider central groove. *Pipilo consobrinus* of Guadalupe Island, on the basis of skin measurements available, is much smaller.

	Measurements in millimeters											
	<i>P. angelensis</i>		<i>P. fuscus</i>			<i>P. maculatus</i>			<i>P. aberti</i>			
	Type	Cotype	max.	aver.	min.	max.	aver.	min.	max.	aver.	min.	
a. Width across maxillaries	7.6	7.6	7.3	7.0	6.9	7.2	7.1	6.9	7.5	7.1	6.8	
b. Height at front of nares	3.1	2.9	3.5	3.1	2.8	3.1	2.9	2.8	3.4	3.5	3.3	
c. Length from anterior end nares to tip of mandible	8.7 ap.	8.7 ap.	8.5	8.2	8.1	8.5	8.2	8.1	8.7	8.4	8.1	
d. Length of nostril	5.4	5.3	5.1	4.9	4.8	5.3	4.9	4.7	5.0	4.9	4.9	
e. Height of nostril	3.2	3.1	3.3	3.1	3.0	3.0	2.86	2.8	3.5	3.3	3.2	
Ratios (in per cent)												
a to c	87.3	87.3	86.5	85.7	85.3	88.9	86.4	84.1	92.6	88.3	83.9	
b to a	40.8	38.1	47.9	43.9	40.6	43.6	41.3	38.9	48.6	47.0	45.3	
d to c	62.1	60.9	62.2	60.5	58.8	62.3	60.1	57.3	60.6	59.1	57.6	
e to d	59.3	58.3	66.0	62.8	60.0	59.6	57.7	56.0	70.0	67.7	65.4	

Pipilo fuscus. Brown Towhee. Two incomplete lower mandibles. The most complete specimen consists of the symphysis and the left ramus, so it is possible to utilize all the characters which distinguish *P. fuscus* from *P. maculatus* in this element. The outer ramal surface of *P. fuscus* exhibits a distinct diagonal ridge which passes anteriorly from the ventral to the dorsal border of the ramus, starting at a point below the end of the ramal foramen and stopping just posterior to the dentary. The ramus of *P. fuscus* descends sharply from the posterior border of the dentary, whereas the ramus of *P. maculatus* is almost straight. In addition to these characters, *P. fuscus* is noticeably smaller than *P. maculatus*, as is illustrated in the following measurements:

Species	L. A. Mus. no.	Length of ramus	Length of symphysis
<i>P. fuscus</i>	Bi 275	23.5	7.0
	Bi 276	23.3	7.0
<i>P. maculatus</i>	Bi 1723	25.7	7.3
	Bi 1724	25.2	7.0
Fossil <i>Pipilo</i>	K. 7298	23.5	6.8

Because this fossil agrees in all characters with *P. fuscus*, it is so assigned. The less complete specimen exhibits enough of these characters so that it can be considered of this species also.

There are two other upper mandibles which may possibly be assigned to this species. They are so fragmentary, however, that positive identification is impossible. That they are definitely *Pipilo* is all that can be ascertained.

Pipilo maculatus. Spotted Towhee. Two upper mandibles. These specimens are similar to *P. maculatus* as distinguished from *P. fuscus* in the greater breadth of the central ridge, sharper secondary ridges, and deeper secondary grooves. In addition, the posterior part of the central groove shows a constriction in *P. maculatus* and the fossil which is lacking in *P. fuscus*.

Pooecetes gramineus. Vesper Sparrow. One upper mandible. The tapering central ridge, broad flat secondary ridges, narrow central groove, and posteriorly flattened inter-narial bridge serve to assign this fossil to *Pooecetes*. It corresponds so closely to available specimens of *P. gramineus*, the only member of the genus now known in North America, that assignment to this species seems justified.

Chondestes grammacus. Lark Sparrow. Three upper mandibles. These three speci-

mens are ascribed to *Chondestes* on the basis of the broad, anteriorly widened internarial bridge, the nearly round nostril, and small ridge on the posterior portion of the internarial bridge. Their resemblance to *Chondestes grammacus* and the fact that this species has no North American relatives today make this assignment logical.

Amphispiza bilineata. Black-throated Sparrow. One incomplete upper mandible (tentatively referred); four lower mandibles. Within this genus there is much variation in the upper mandible. The characters that remain constant, and therefore may be considered of generic value, are the broad and fairly deep central groove and the slender shape of this element. *Spizella* is the only genus with which *Amphispiza* might be confused. The latter differs from *Spizella*, however, in having a relatively broader internarial bridge. The fossil specimen is so fragmentary that identification is difficult. It appears, however, to resemble *Amphispiza bilineata* in having deep secondary grooves and sharp secondary ridges rather than the poorly developed ones of *Amphispiza belli*, and so is tentatively referred to this species.

The four lower mandibles assigned here all show the long rami and small symphysis characteristic of *Amphispiza bilineata*. Like the upper mandible this element in *Amphispiza* might be confused with that of *Spizella*. It differs from this latter genus, however, in having longer dentaries and a smaller foramen in the ramus. *Amphispiza bilineata* may be distinguished from *A. belli* by: (1) higher and relatively shorter rami, (2) possession of a definite diagonal ridge running anterordorsally, which is much more distinct in *A. bilineata* than in *A. belli*, (3) presence on the outer surfaces of the rami of *A. bilineata* of shallower grooves than in *A. belli*. The fossils are well preserved and so are definitely assigned to *Amphispiza bilineata*.

It is interesting to note that of this species more lower mandibles have been recovered than upper. Judging from structure of these elements as exhibited by modern *A. bilineata*, this may be explained by the seemingly greater durability of the lower mandible.

Spizella, sp. Six upper mandibles (one complete). The conspicuous central groove and the slender internarial bridge serve to assign these fossil upper mandibles to *Spizella*. The most complete specimens seem to approach *S. arborea* in size of the nostril. The fragmentary condition of most of the specimens and lack of complete comparative material make it unwise to attempt specific assignment.

Zonotrichia leucophrys. White-crowned Sparrow. Three upper mandibles. The upper mandible of *Zonotrichia* has a wide central groove and wide secondary ridges. It might be possible to confuse it with *Melospiza melodia* except that it lacks the great elevation of the internarial bridge of the latter species. *Zonotrichia leucophrys* and *Z. coronata*, the species which occur in the Los Angeles area today, resemble each other closely except that in the latter species the ratio of nostril length to the width of mandible through the maxillaries is noticeably higher. These ratios in the fossils agree with those of *Z. leucophrys*.

Measurements in millimeters

Species	L. A. Mus. no.	Length of nostril (a)	Width across maxillaries (b)	Ratio of (a) to (b) in per cent
<i>Z. leucophrys</i>	Bi 1321	4.0	6.0	66.7
	Bi 1321'	4.0	6.1	65.6
	Bi 1678	4.1	6.0	68.3
	Bi 1682	4.1	6.3	65.2
<i>Z. coronata</i>	Bi 1320	4.3	6.0	71.7
	Bi 1402	4.5	6.1	73.8
	Bi 756	4.5	6.3	71.5
Fossil <i>Zonotrichia</i>	K7288(a)	4.1	6.2	66.2
	K7288(b)	3.8	6.0	63.3
	K7288(c)	4.1	6.3	65.2

Passerella iliaca. Fox Sparrow. Two lower mandibles. Both of these specimens exhibit the internal flange on the ramus which characterizes *Passerella iliaca*, as pointed out by A. H. Miller (Univ. Calif. Publ. Bull. Dept. Geol. Sci., 21, 1932:182). One of these specimens is much larger than the other and corresponds in length of the ramus (25.2 mm.) to measurements of the subspecies *stephensi*, *brevicauda*, and the large type of *mariposae* from Shaver, California, as given by Linsdale (Univ. Calif. Publ. Zool., 30, 1928:321). The smaller fossil, which is 22 mm. in length, agrees with Linsdale's measurements of subspecies *iliaca*, *townsendi*, *fuliginosa*, *canescens*, and the populations of *mariposae* from Manzanita Lake and Lake Tahoe, California.

Melospiza melodia. Ten upper mandibles. These fossil specimens exhibit the noticeably elevated nasal bridge and the palatal surface with a narrow central groove and indistinct secondary ridges characteristic of *Melospiza*. Both *M. lincolni* and *M. georgiana* have markedly smaller mandibles than the fossils. Specimens of *M. melodia*, however, agree closely in all respects.

Life-zone and Habitat Preferences of Existing Fringillid Species Here Listed from the
Pleistocene of Rancho La Brea

Species	Number of specimens	Life-zone and habitat today ¹
<i>Hesperiphona vespertina</i>	1	Canadian and Transition zones (breeding). Firs (breeding). In other seasons, most any bud or berry-producing tree or bush.
<i>Pooecetes gramineus</i>	1	Canadian (occasionally), Transition, and Upper Sonoran zones (breeding). Open, or sparsely covered grassland.
<i>Passerella iliaca</i>	2	Canadian, Transition (breeding), and Upper Sonoran zones. Chaparral.
<i>Zonotrichia leucophrys</i>	3	Anywhere below level of heavy snow. Low bushy type of cover.
<i>Pheucticus melanocephalus</i>	2	Transition, Upper and Lower Sonoran zones. Riparian woodland, oak woodland, and associated shrubs, and open coniferous forests.
<i>Spinus tristis</i>	2	Transition (near coast), Upper and Lower Sonoran zones. Riparian association, chiefly willows and cottonwoods (breeding). Open fields.
<i>Pipilo maculatus</i>	2	Upper Sonoran Zone. River-bottom thickets and chaparral.
<i>Melospiza melodia</i>	10	Upper Sonoran Zone. River-bottoms. Shrubs, fresh-water marshes.
<i>Pipilo fuscus</i>	2	Upper Sonoran Zone. Edges of chaparral. Open brushland and oaks.
<i>Chondestes grammacus</i>	3	Upper and Lower Sonoran zones. Open terrain with scattered bushes and trees.
<i>Amphispiza bilineata</i>	4	Lower Upper Sonoran, and Lower Sonoran zones. Sparsely vegetated desert terrain.

¹ With special reference to southern California.

CONCLUSIONS

With the exception of *Pipilo angelensis*, all the species here discussed occur in the Los Angeles area today. Excluding *Amphispiza bilineata* and that unpredictable wanderer, *Hesperiphona vespertina*, all could conceivably be found at some time of the year in the Rancho La Brea area itself, if it were not for the changes brought about by city growth.

The accompanying chart lists the life-zones and habitat preference of each of these species. From these it is possible to construct a picture of Pleistocene Rancho La Brea which agrees very closely with that given by A. H. Miller (Univ. Calif. Publ. Bull. Dept. Geol. Sci., 19, 1929:18-19) in connection with other passerine birds.

The area around the tar pits must have offered meadows or open fields, brush, and probably some type of riparian growth in addition to the trees that are known to have occurred there. The meadows or open fields and their weedy borders would have been suitable for such forms as the goldfinches and the Vesper and Lark sparrows. The brush would have afforded shelter for the towhees, Fox Sparrows, and zonotrichias. Extensive chaparral areas are found in the Santa Monica Mountains, a short distance from Rancho La Brea, today. A riparian association would have suited the goldfinches and Song Sparrows and very possibly *Pheucticus*. The live oaks and other trees recorded in the area by Frost (Univ. Calif. Publ. Bot., 14, 1927:73-98) could also have afforded suitable environment for this latter bird.

Hesperiphona is not as illogical a visitor as it may seem. There is a Recent record (Willett, Pac. Coast Avif. No. 21, 1933:160) of its occurrence in Cahuenga Pass approximately 5 miles from Rancho La Brea. In the tar pits, evidences have been found of its environmental associates, the Pileated Woodpecker and Saw-whet Owl (A. H. Miller, Condor, 39, 1937:252).

As stated by Sibley (Condor, 41, 1939:126), who reported both *Amphispiza bilineata* and *A. belli*, using mandibular material from the University of California's Rancho La Brea locality no. 2051, the occurrence of the Desert Sparrow suggests a rather arid climate. Even though *A. bilineata* seems out of harmony with the rest of the species listed here, a shrew with similar environmental requirements (*Notiosorex*) has been found in great numbers (Compton, Univ. Calif. Publ. Bull. Dept. Geol. Sci., 24, 1937:87-88).

The list of fringillid species presented here not only augments existing knowledge of the passerine population of the Rancho La Brea deposits, but also further confirms previous ideas as to the environmental conditions existing in the area during the Pleistocene.

Los Angeles County Museum, November 24, 1947.

NESTINGS OF SOME PASSERINE BIRDS IN WESTERN ALASKA

By LAWRENCE H. WALKINSHAW

On May 25, 1946, John J. Stophlet, Jim Walkinshaw and the writer reached Fairbanks, Alaska, bound for Bethel near the mouth of the Kuskokwim River, on the Bering Sea coast. Floods prevented landing at the air field at Bethel and our plane turned back to McGrath, 275 miles up-river. Bethel finally was reached by boat on June 1 and on June 4 we were flown to a cabin 30 miles to the west on the Johnson River. This river originates north and east of Bethel between the Yukon and Kuskokwim rivers and flows into the Kuskokwim about 30 miles below Bethel.

Breeding birds were observed extensively, especially at the Johnson River locality, where we were stationed from June 4 to 22. Particularly favorable opportunities were presented to observe and photograph the nests of Yellow Wagtails, Redpolls and Tree Sparrows among the passerine birds of the area. Our notes on these species are presented herewith.

Motacilla flava alascensis. Yellow Wagtail. On a short trip into the tundra northwest of Bethel, on June 2, we observed eight individuals, all males, and all singing. In 165 hours afield at Johnson River 153 individuals were counted.

Each male was strongly territorial, defending its area against other male wagtails. Above the territory he gave his aerial song, but he also had song perches. If we appeared on a territory the male flew to meet us, coming to a spot about 8 to 15 meters overhead where he continued to scold while we were in close proximity of the nest area. This scolding helped locate the nests. The males also scolded Sandhill Cranes when they appeared in the vicinity of the nests, but they paid little attention to other birds.

Song perches often were only 30 centimeters from the ground, on the tops of tussocks, but others consisted of tops of bushes about 180 centimeters in height. In aerial song the males flew to about eight to twelve meters, and after the song dropped back to the ground or to some bush.

The song was usually a high *tzee-zee-zee*, or a *ter-zwee--ter-zwee--zwee--zwee*. The regular rate of singing was about seven times per minute on warmer days during the morning. The birds sang periodically throughout the day, but not continuously. One rainy, cold day, June 7, when the wind was raw and strong, a male sang near our cabin near Johnson River at 5:35 p.m. He also was searching for food about the sod igloo just a few meters from the window where I was watching him. He returned again at 6:05 p.m. to sing at the rate of seven times per minute, but remained only a short time. He was back again at 6:30 p.m., singing. On June 6 he had been observed giving his aerial song from as low as 60 centimeters from the ground. Wagtails sang another warbler-like song, usually on warmer days.

Four nests were found, three of which contained eggs. Two of these were found on June 12, 1946, at Johnson River. The first was under construction, the female carrying the material as the male sang nearby. The nest was on a two-meter bank on the tundra, underneath overhanging bushes of Alaska tea, dwarf birch, cranberry and crowberry. It was in a hollowed-out spot, well back in the steep bank.

The second nest was much like a Tree Sparrow's nest, built on a steep bank just a little over one meter high. It was under Alaska tea, dwarf birch, and crowberry, and was composed of grasses and sedges, and lined with ptarmigan feathers. The diameter was 60 millimeters and the inside depth 37 millimeters. The six eggs were heavily spotted with small pink and reddish spots, distributed over the entire surface.

A nest found on June 16 was on the steep side of a 22-centimeter hummock, many of which were found on the open Alaskan tundra. The nest was hidden underneath dwarf birch, Alaska tea, cotton sedges, and sedges, and was made of cotton sedges and grasses, with a good lining of ptarmigan feathers. Both male and female scolded me with a sparrow-like *keee* or *zeeep*.

On June 18, 1946, I began a search for a nest along the steep bank of the Johnson River which was about eight meters high near our cabin. About two meters from the top



Fig. 17. Yellow Wagtail at nest, 30 miles west of Bethel, Alaska, June 20, 1946.

I finally found the nest of the pair of Yellow Wagtails which had scolded us so much when we walked by that place. It was well hidden on the steepest portion of the bank and behind a tussock of dead grass. Made of dead grasses, it was similar to the others and measured 47 millimeters across and 49 millimeters inside. Photographs were taken of the female on June 20.

At this nest it was found that the female left when the male scolded us. Both birds then flew over us calling repeatedly while we were near. As soon as we retreated a short

distance, the female returned to the eggs. Both birds, like the other wagtails, were very nervous and wagged their tails continuously while we were near. John Stophlet examined the nest on June 22, finding two newly hatched young.

Acanthis hornemanni. Hoary Redpoll. *Acanthis flammea*. Common Redpoll. The resemblance of these two species is marked, but in flight the Hoary Redpoll shows much more unstreaked gray on the rump. In order definitely to identify the species at each nest it would have been necessary to collect the birds, which we did not do. A male Common Redpoll was taken at McGrath from a small flock on May 29, 1946. The rump was streaked throughout and he, like the others in his flock and in the McGrath region, was darker in appearance than a pair observed in Fairbanks. This pair had a nest on a horizontal limb 6 meters high in a white birch almost in the heart of town. The young



Fig. 18. Another view of the Yellow Wagtail, here about to settle on nest.

were finally counted as they called for food in the yard where the nest was situated. This was on May 26, 1946. Some of the young were in a nearby spruce about 20 meters from the nest, others were in the nest tree and all periodically flew about the yard. One flew into the side of a building and was killed; he was a male and weighed 12.2 grams. The male taken at McGrath weighed 13.4 grams.

I am sure that the majority of redpolls at Fairbanks and McGrath were Common Redpolls. However, when we reached Bethel, we found many of the lighter colored species. Henry Kyllingstad, who has lived in the area for several years and handled many, identifies these lighter birds as Hoary Redpolls.

Brandt (Alaska Bird Trails, 1943:441) considered the Hoary Redpoll as the commonest species at Hooper Bay, but he found two nests of the Common Redpoll there. I feel sure that at Bethel the two species were present in about equal numbers and at Johnson River, 30 air-miles away, there were a few more Hoary Redpolls than Common Redpolls. I did not observe any Redpolls on a visit to Chevak in the Hooper Bay region. There is much less shrubbery there near the Bering Sea.

Since the behavior of the two kinds appeared similar, the following notes pertain largely to both. It is my belief that as a rule the Hoary Redpoll nested closer to water, often over shallow water, whereas the Common Redpoll nested in the willows on the higher tundra.

At Bethel and along Johnson River we found nine nests of redpolls. Henry Kyllingstad showed us two of these and John Stophlet found one. Seven were in small willows, one in a low alder, and the other in a picket-fence grave marker at Bethel. The willows over the tundra were rarely over one to one and a half meters tall. In many of them clumps of old leaves remained over natural crotches, producing a well-concealed site for the nest. I soon found that when redpolls scolded me in the vicinity of such groups of willows, they had a nest there.

The height of the nine nests varied from 27.9 to 99 centimeters, above ground, averaging 55.2. Five nests of the Hoary Redpoll averaged 71 centimeters above ground (30.5-99) and four Common Redpoll nests, 35.6 (27.9-41). Five Hoary Redpoll nests averaged 48.8 millimeters in inside diameter and 37.0 in depth. The outside diameters of the two species differed little: depth was 78 millimeters (68-91) and diameter, 104 (87-127).

Brandt (*op. cit.*:443) states that the Common Redpoll builds the greater portion of the exterior of its nest with small twigs whereas the Hoary Redpoll uses bronze-tinted grasses interwoven with silvery plant down and threads of bark. This was true in the nests we found. The twigs used were willow, alder, Alaska tea, and crowberry, and inside this mass, grasses and sedges, and a lining of finer grasses and Ptarmigan feathers were placed. All nests were well built. In fact I found many of the past years' nests in the low leafless willows at Johnson River.

Most of the eggs that I examined were similar to those of the Field Sparrow (*Spizella pusilla*) which I have seen in southern Michigan. Some were capped at the larger end with reddish brown spots, others were wreathed or capped with reddish-brown and lavender and some had black scrawls like those found on the eggs of the Baltimore Oriole (*Icterus galbula*). The number of eggs was either four or five, the sets averaging 4.3 eggs.

The average measurements of 11 eggs of the Hoary Redpoll were 17.57×12.76 millimeters and the average weight of seven was 1.50 grams. The average of 10 eggs of the Common Redpoll was 17.42×12.90 and the weight of five, 1.32 grams.

Brandt (*op. cit.*:443) states that in Common Redpolls the "spots, while concentrated at the large end, are never found to be wreathed as in the case of the Hoary Redpoll."

Lawrence Grinnell (Wilson Bull., 55, 1943:158) gives the incubation period of the Common Redpoll as 10 to 11 days, and the brooding period at one nest as 11 or 12 days. We found that usually when three young hatched the first day, the fourth hatched the following day. In five-egg sets, four usually hatched the first day. The newly hatched young appeared grayish in color with dark to light mouse gray down about 7 mm. long. At a nest found on June 9, three young hatched on June 10 and the fourth on June 11. On June 19, two of these young left the nest when nine days old; the others remained at least until June 20. The growth rate of the young is given in the table.

At the nest just mentioned I spent from 12:48 p.m. until 3 p.m. on June 13 in a photographic blind. The following notes were taken:

12:48 p.m. Female left nest.

1:15 p.m. Female returned and regurgitated food to all four young. Then she settled low on nest.

1:50 p.m. Male near, called *che-wee, che-wee*. Female with vibrating wings faced in his direction. He was frightened by the blind, so did not come at once. Female left the nest and went to him, whereupon he gave her food.

2:01 p.m. Female returned and fed all of young. Swallowed excreta.

2:10 p.m. Female left nest.

2:15 p.m. Female returned; brooded.
 2:20 p.m. Female frightened off. Weather cold.
 2:40 p.m. Young still holding heads up when wind rocked nest, as they did again at 2:49.
 2:50 p.m. Raining.



Fig. 19. Common Redpoll at nest, 30 miles west of Bethel, Alaska, June 13, 1946.

2:52 p.m. Male near, called *chee-chee-chee-chee*.
 2:53 p.m. Female returned, brooded.
 2:59 p.m. Female fed young as she raised up. After feeding she ate excreta. The female at one nest went onto the empty nest as I measured and weighed her eggs nearby. She allowed me to approach to within 61 centimeters and then only went a few meters away. The males were much wilder. I watched them on occasion give an aerial song similar to that of the American Goldfinch, an undulating flight with the song *che-wee-wee-wee*.

Average Growth Rate of Young Redpolls at Johnson River, Alaska

Age	Number of individuals	Wt. in grams	Wing in mm.	Tarsus in mm.	Culmen in mm.	First Primary
Hatching	4	1.3	5.3	5.2	3.0	
One day	4	1.9	6.2	5.2	3.7	
Two days	7	2.9	7.0	7.1	3.6	
Three days	2	3.2	8.0	8.0	4.0	
Four days	5	4.6	11.6	9.8	4.1	trace
Six days	1	4.1	12.0	11.0	4.0	1
Seven days	3	6.5	20.3	14.0	5.0	8.6

Spizella arborea ochracea. Western Tree Sparrow. On May 26, 1946, when we made our first field trip into the muskeg areas near Fairbanks, the song of the Tree Sparrow was often heard. At McGrath and along the Kuskokwim River it was not seen but at Bethel and Johnson River it was one of the most common species. I did not observe any at Chevak.

The song of the male, *sweet-swee-see-see*, was given from some bush or from the ground on the tundra. Even at Fairbanks where there were trees from which they could sing, Tree Sparrows usually sang from points no higher than 130 centimeters from the ground. Each male had his territory, but we arrived too late to see many territorial battles.

Many of the males at Fairbanks were not mated on May 26 but when we arrived at Bethel and Johnson River, on June 2 and 4, they were paired and the females were



Fig. 20. Two views of Tree Sparrow at nest with young, 30 miles west of Bethel, Alaska, June 17, 1946.

building nests. Some had eggs. Henry Kyllingstad showed us a nest with three eggs at Bethel on June 2, 1946, and I found a nest with five eggs on June 4, 1946, at Johnson River. Four of these eggs hatched on June 16; the fifth on June 17.

A female was carrying nesting material to a new nest on June 4. She obtained this material at least 100 meters from the nest and did all of the work of nest construction, but she was accompanied on each trip by the male, the two flying from bush to bush as they proceeded toward the nest. Other nests were found as follows: June 5, nest with five eggs; June 6, nest with five eggs; June 8, nest with five eggs; June 11, nest with five eggs; June 12, nest with five eggs; June 15, nest with five eggs.

Six nests were built on the ground, the rims even with the moss and the tops well hidden by Alaska tea, crowberry, dwarf birch, cranberry, or alder. One was built similar to these but on the side of a steep two-meter bank much like the nest of a wagtail. The other nest was built in a low marshy area in a clump of tall, dead, rank grass. It was 14 centimeters from the ground and there was some water within just a few centimeters of it. The outside diameter of this nest was 120 millimeters. Usually the nest was built under the base of some shrub but occasionally far from the nearest shrubbery, well out on the open tundra.

Nests were constructed of mosses, mostly with some finer grasses to give them strength, and were lined with a layer of ptarmigan feathers. The average diameter of the interior of six nests was 58 millimeters (49-69); the average depth, 50.6 (47-57).

The eggs showed a bluish tinge over which were many brownish spots, often several millimeters wide. On some eggs there were so many spots that the ground color was not discernible; on others there were fewer spots. The sets were very similar. The largest eggs measured 20.5×15 and 20×15.4 millimeters; the smallest, 17.5×14 and 20×13.7 millimeters. The heaviest egg weighed 2.3 grams and the lightest, 1.8 grams.

Incubation was performed by the female alone. At the nest found on June 4, with a full complement of eggs, they hatched 12 and 13 days later. Baumgartner (Bird-Banding, 8, 1937:108) gave the incubation period as 12-13 days for the eastern race of Tree Sparrow (*Spizella arborea arborea*). At hatching, the young Tree Sparrow resembles the young of the Field Sparrow. The skin is flesh colored and the down is mouse-gray, about five to seven millimeters in length.

The weights of four young the day of hatching varied between 1.5 and 1.9 grams, averaging 1.8; at one day of age five young averaged 2.5 grams (2.2-2.8); at two days, 4.3 grams (3.6-4.8); at four days, 6.7 grams (5.0-8.2). None was studied after that date. The primaries began showing through the skin when two days of age and they had broken through slightly on the following day. The young at three days of age gave a low lisping call when handled.

On June 17 when I photographed the parents at a nest near our cabin, both were feeding insects to five young. The male was afraid of my blind and camera and fed only at 4:52, 5:33, and 5:45 p.m.; the female fed at 4:00, 4:07, 4:15, 4:40, 4:45, 4:50, 5:12, 5:20, 5:30, and 5:32 p.m. Thus, in one hour and 45 minutes the young were fed 13 times. Usually when approaching, the adults landed in a nearby alder and then proceeded cautiously to the nest.

Battle Creek, Michigan, August 15, 1947.

SYSTEMATIC COMMENT ON SOME GEOGRAPHICALLY VARIABLE BIRDS OCCURRING IN UTAH

By WILLIAM H. BEHLE

For the past several years, the writer, accompanied by various students, has carried on periodic field work in selected areas of Utah. As a result, series of study skins for many species have accumulated which, together with specimens already in the Museum of the University of Utah, yield data bearing on problems of distribution and variation of the birds in the State. It seems desirable to record the following findings for reference in preparing check-lists and regional reports now nearing completion and to clear up some of the questions raised in the writer's check-list of the birds of Utah (*Condor*, 46, 1944:67-87). The specimens here discussed, among others, were compared in August, 1947, with the collections in the Museum of Vertebrate Zoology and I am indebted to Alden H. Miller and his associates for courtesies rendered and for help in the subspecific determination of many forms. A few specimens were compared with those in the California Academy of Sciences through the courtesy of Robert T. Orr. I am indebted also to A. J. van Rossem for comparing some Utah birds with the material in the Donald R. Dickey Collection at the University of California at Los Angeles. Acknowledgment is due the University of Utah Research Committee for a grant covering transportation costs for the trip to Berkeley.

Otus asio.—In the writer's check-list two races, *O. a. inyoensis* and *O. a. cineraceus*, were listed. The former was said to occur in northern Utah and the latter was supposed to range through central and southern Utah. The two specimens from 19 miles south of Moab (see *Wilson Bull.*, 53, 1941:182) as well as the other screech owls in the collection of the University of Utah from Utah have been examined lately by several systematists and the general consensus is that the examples from central and southeastern Utah, at least, are closest to darker colored individuals of *inyoensis* than to anything else. They have the large size of that race. However, there are some indications of a long transition between *inyoensis* and *cineraceus*. The occurrence of true *cineraceus* in southwestern Utah remains to be demonstrated. In any event, the race *cineraceus* does not occur in central Utah as indicated in the writer's check-list.

Chordeiles minor.—Four races of nighthawks of this species have been reported from Utah, three as breeding in various sections of the state, the other as a transient. Yet another race appears to pass through the state in migration. On June 9, 1944, five nighthawks were taken from a group feeding in the evening over a stream near the Midway Fish Hatchery, 5450 feet, Midway, Wasatch County, Utah. Four prove to be of the race *C. m. hesperis*, but the fifth, a male, represents the eastern race *C. m. minor*.

Empidonax traillii.—When Oberholser (*Sci. Publ. Cleveland Mus. Nat. Hist.*, 4, 1932:3) described the race *E. t. adastus* he indicated that birds from northern Utah, among other areas, were intermediate between the new race and *E. t. brewsteri*, but closest to the former. Twomey (*Ann. Carnegie Mus.*, 28, 1942:412) accepted the race *adastus* and following Oberholser referred his Uinta Basin birds from northeastern Utah to that race. In the writer's check-list the Utah birds were considered as of the race *brewsteri*, largely on the basis of Miller's conclusions (*Condor*, 43, 1941:259) that the race *adastus* is untenable. More evidence is now at hand on which to base a conclusion. The 45 specimens in the collection of the University of Utah include two fair series, one of 12 birds from the St. George-Kanab area in southern Utah, and another of similar number from Midway, Wasatch County, northern Utah. These were compared with the extensive material in the Museum of Vertebrate Zoology, including 11 near topotypes of *adastus*.

When Oberholser described the western population as *brewsteri* (Ohio Jour. Sci., 18, 1918:85-98), he commented on the extreme individual variation displayed and the presence of color phases. The specimens from the Warner Valley region of Oregon vary, as Miller has stated, from bright green to greenish brown to dull gray-green in color of dorsum but with no segregation into phases. The same is true of the Utah series. There are no average differences in measurements between the Utah samples and those of the Great Basin. Thus it seems, we have only one race of this species of flycatcher to include in the check-list of Utah birds.

Empidonax difficilis.—Utah seems to be a meeting ground between two populations of the Western Flycatcher. In the writer's check-list, all Utah specimens were considered to be of the race *E. d. difficilis*. Since then, Woodbury (Bull. Univ. Utah, 35(14), 1945: 77), upon the basis of Brodkorb's determination, lists specimens from the Navajo Country as of the race *hellmayri* (Occas. Papers Mus. Zool., Univ. Michigan, No. 306, 1935:1-3). Three breeding specimens from the Wasatch Mountains collected lately by the writer and six taken by George Todd in the Raft River Mountains of northwestern Utah help elucidate the distribution of the two races in the state.

	Males						
	Number	Min.	Wing Mean	Max.	Min.	Tail Mean	Max.
West coast <i>E. d. difficilis</i> (Brodkorb)	26	63.0	66.7	68.5	51.5	56.7	60.5
Raft River Mts., Boxelder Co., Utah	4	65.4	68.8	73.7	57.2	58.0	59.0
Wasatch Mts., Salt Lake Co., Utah	2	70.7	70.7	70.7	61.7	62.1	62.5
San Juan Co., Utah-Navajo Co., Arizona	2	73.4	74.4	75.4	62.4	63.4	64.4
<i>E. d. hellmayri</i> (Brodkorb)	9	67.0	71.3	74.0	57.0	61.0	63.5
	Females						
	Number	Min.	Wing Mean	Max.	Min.	Tail Mean	Max.
West coast <i>E. d. difficilis</i> (Brodkorb)	19	59.0	62.4	65.5	52.0	54.2	57.5
Raft River Mts., Boxelder Co., Utah	2	63.0	63.3	63.6	55.7	56.5	57.3
Wasatch Mts., Salt Lake Co., Utah	1	.....	65.7	.....	.....	63.0	.....
San Juan Co., Utah-Navajo Co., Arizona	4	63.0	65.1	66.7	57.4	58.3	59.0
<i>E. d. hellmayri</i> (Brodkorb)	5	66.0	67.0	67.5	56.5	58.6	62.0

As a group the Utah birds are too large for *difficilis* but a little small for good *hellmayri*. However, there are indications that those from southeastern and central Utah as far north and west as the Wasatch Mountains are closest to *hellmayri* while the flycatchers from the west desert ranges are closest to *difficilis*. The populations thus separated are not typical of either race, however, which is to be expected if they are in a marginal area. Variation is particularly noticeable in the Raft River series where some individuals are grayer than others and one male has the size of *hellmayri*. This is similar to the hermit thrush situation in the same area. The Wasatch Mountain birds have a slightly brighter green color to the dorsum than west coast examples of *difficilis*, which feature together with size rules against their assignment there. The San Juan specimens seem most clearly referable to *hellmayri*. Thus until further material accumulates from this intermediate area, it seems best to recognize the occurrence of these two races in the state.

Eremophila alpestris.—The distribution of the races of Horned Larks in Utah has been set forth previously by the writer (Proc. Utah Acad. Sci., Arts and Letters, 19-20, 1943:153-156). At that time no material was at hand from southwestern or central-southern Utah. Birds from southeastern Utah were assigned to the race *occidentalis* although considered intergradational between that form and *leucolaema*. A small series of five Horned Larks from the vicinity of Kanab, Kane County, are likewise to be placed with *occidentalis* but being on the margin of the range are atypical and tend toward more northern populations. Whether this intergradation extends as far east as the St.

George area is unknown, since breeding specimens are not yet available from that area. However, the writer collected five specimens on January 5, 1937, 15 miles northeast of St. George, Washington County, Utah, which are now in the Museum of Vertebrate Zoology and which have not heretofore been reported upon. Four of these are close to *utahensis*. The other, although in fresher plumage, shows a deeper brown color to the dorsum suggesting the influence of *occidentalis*.

Petrochelidon albifrons.—In the check-list of the birds of Utah, the writer considered all the Cliff Swallows to be of the race *P. a. hypopolia* (Oberholser, Canadian Field Nat., 33, 1919:95), although calling attention to the systematic discussion involving the proposed race *aprophata* (Oberholser, Sci. Publ. Cleveland Mus. Nat. Hist., 4(1), 1932:6) and pointing out that the birds of northeastern Utah had been listed under *P. a. albifrons* by Twomey (Ann. Carnegie Mus., 28, 1942:417). Since then, Woodbury (Bull. Univ. Utah, 35(14), 1945:84) has likewise referred his specimens from southeastern Utah to *albifrons*. To help settle the matter of the distribution of the Cliff Swallows in Utah, the writer has collected 38 breeding birds from several localities in the state. These skins together with others in the collection of the University of Utah indicate that two races are indeed represented in Utah's avifauna.

Place	Males						
	Number	Min.	Wing Mean	Max.	Min.	Tail Mean	Max.
<i>P. a. hypopolia</i> (from Oberholser)	5	110.0	112.1	115.0	49.0	50.7	52.0
5 mi. N. Ibapah, Tooele Co.	2	110.4	111.5	112.6	52.0	52.2	52.5
Peoa, Summit Co.	6	109.2	111.5	115.0	47.4	49.5	51.5
Midway, Wasatch Co.	13	106.0	108.3	112.6	45.6	49.1	51.6
Currant Creek, Wasatch Co.	3	106.4	109.6	111.7	47.5	49.3	51.3
Salina, Sevier Co.	1	.....	109.0	.....	.....	50.4	.....
Kanab, Kane Co.	6	104.2	108.4	111.2	46.7	48.1	53.8
Moab, Grand Co.	1	.....	109.2	.....	.....	47.4	.....
Near Monticello, San Juan Co.	1	.....	107.0	.....	.....	49.7	.....
<i>P. a. albifrons</i> (from Oberholser)	7	105.0	107.6	112.0	47.0	49.9	51.0
Females							
<i>P. a. hypopolia</i> (from Oberholser)	5	108.0	110.2	111.5	49.5	50.7	51.5
5 mi. N. Ibapah, Tooele Co.	2	111.5	111.9	112.4	51.2	52.0	52.8
Bear River Refuge, Boxelder Co.	1	.....	111.5	.....	.....	47.4	.....
Peoa, Summit Co.	1	.....	106.4	.....	.....	47.5	.....
Midway, Wasatch Co.	6	107.3	109.2	112.0	49.0	50.2	51.5
Kanab, Kane Co.	8	105.2	107.8	113.5	46.2	48.7	53.3
<i>P. a. albifrons</i> (from Oberholser)	11	102.0	107.2	109.0	47.0	48.9	51.0

From these figures it would appear that in Utah the southern limits of the large-sized northern population called *hypopolia* are reached and a transition to *albifrons* occurs. The four specimens from near Ibapah, Tooele County, Utah, are large-sized and seemingly referable to *hypopolia* as is the single specimen from the Bear River Refuge. In making this assignment, the writer is in agreement with van Rossem (Pac. Coast Avif. No. 24, 1936:33) and Miller (Condor, 43, 1941:261) that it is not desirable to recognize the proposed race *aprophata*. It is noteworthy that these two localities are in the Great Basin portion of the state. The specimens from Peoa, Summit County, in the Wasatch Mountains, east of Salt Lake City, are, save for the single female, large sized, most individuals falling in the size-range of *hypopolia*. However, the sample from the nearby Midway colony has an average size that is smaller and is more nearly in accord with that of *albifrons*. While some individuals approach *hypopolia* in size, most fall in the size-range of the smaller southern race. The rest of the Utah representatives listed, mostly from the Colorado River drainage, are close to the size limits of *P. a. albifrons*.

The racial affinities of the Cliff Swallows from the Uinta Basin in northeastern Utah

are still in doubt. Twomey (*loc. cit.*) indicated that seven specimens had been collected two miles south of Jensen. The specimens were not available for study, being non-existent in the collection or the catalog of the Carnegie Museum, according to W. E. Clyde Todd (*in litt.*).

As further evidence that the Great Basin population is different from that of the rest of the state is the circumstance that the forehead patch of the Ibapah specimens is whiter and more extensive than in other populations. However, this is a variable character and individual variants of the Kanab and Midway series match the Ibapah specimens. Cliff Swallows from the Navajo Country have the brownest foreheads of all, suggesting an approach in this character to *P. a. tachina*.

Aphelocoma coerulescens.—Until the time of Pitelka's description of the Nevada Scrub Jay, *A. c. nevadae* (*Condor*, 47, 1945:24), the Utah jays were considered to be of the race *A. c. woodhouseii*. On the basis of Pitelka's work, which included study of specimens in the collection of the University of Utah, the jays of the western part of the state in the Great Basin portion are good *nevadae* whereas those of eastern Utah and extreme southeastern Utah are to be relegated to *woodhouseii*. However, the specimens from eastern Utah are not typical of the Colorado-New Mexico form. Indeed a gradual transition occurs across Utah where *nevadae* blends into *woodhouseii*. Details of this intergradation between the two races insofar as the available material reveals, are soon to be presented by Pitelka. It will suffice to point out here that a series of 15 specimens collected mostly this last year from the vicinity of Kanab, Kane County, Utah, are intermediate between the two races, standing closest, perhaps, to *nevadae*.

Parus atricapillus.—When Linsdale (*Condor*, 40, 1938:37) described the race *P. a. nevadensis*, specimens were known only from the type locality in Nevada and two locations in adjacent southern Idaho. Twomey (*Ann. Carnegie Mus.*, 28, 1942:421) designated his specimens of this species from northeastern Utah as *P. a. septentrionalis*. The writer thought the race *nevadensis* ranged throughout Utah and so indicated in his check-list. Duvall, in his review of the Black-capped Chickadees (*Auk*, 62, 1945:49-69) gave the range of *nevadensis* as north to southern and central-eastern Idaho, west to northeastern Nevada, south to north-central Utah and east to extreme southwestern Wyoming. His Utah material was from the Raft River Mountains, Salt Lake City, Provo, and Laketown. The race *septentrionalis* he reports ranges west to eastern Idaho, western Wyoming except the extreme southwestern portion, southwestern Colorado, and northwestern New Mexico.

Specimens at the University of Utah further clarify the distribution of the two races in the state indicating that the Great Basin chickadees represent *nevadensis* while those from the eastern part of the state are closest to *septentrionalis*. A long east-west intergradational area occurs between the two races. Recently acquired breeding specimens from George Creek, 6500-6700 feet, 7 miles southeast of Yost, Raft River Mountains, Boxelder County, Utah, and an autumn skin from Clear Creek in the same mountains are indeed *nevadensis*. Two additional autumn specimens identical with topotypes of *nevadensis* are from 41 miles east of Ogden.

Four breeding birds from Midway, 5450 feet, Wasatch County, Utah, one from Snake Creek Canyon, 6000 feet, 3 miles northwest of Midway, and one from Cummings Flat, 7200 feet, 11 miles northeast of Heber, Wasatch County, seem to be best designated *P. a. septentrionalis*, although intergradational between the two races. Being in worn plumage, little can be told of dorsal coloring. However, the white margins of the greater wing-coverts, secondaries and lateral rectrices are narrower than in *nevadensis*, a circumstance not apparently due to wear. A specimen taken on October 17, 1931, at Stockmore, Duchesne County, Utah, is clearly an intergrade, this time having the white

features of *nevadensis* but a darker back than that race. That this intergradational area is even more extensive is indicated by Duvall (*op. cit.*:61) in his comment on two old specimens from Green River, in eastern Utah.

Evidently some of these intergrades from east of the Wasatch front move into Salt Lake and Utah valleys for the winter, for seven examples taken at four localities have the narrower feather edgings of *septentrionalis*. Adventitious coloring in the form of soot has altered the dorsal coloring considerably. Of this lot, three are from the mouth of North Canyon, 4600 feet, 2 miles south of Bountiful, Davis County; two are from the mouth of Little Cottonwood Canyon, 4500 feet, 5 miles southeast of Union, Salt Lake County; one is from the Jeremy Ranch, 4210 feet, 2 miles west Cudahy Packing Plant, Salt Lake County; and one is from Jordan River near Camp Williams, 3 miles north of Lehi, 4300 feet, Utah County.

Parus gambeli.—In the check-list, the race *P. g. inyoensis* was indicated as the breeding bird in southwestern Utah (Pine Valley Mountains) and it was thought to be the form of the mountains of the west desert portion of the state. A series from the Deep Creek Mountains of central-western Utah and a few examples from the Raft River Mountains of northwestern Utah recently acquired corroborate this. They seem closest to the race *inyoensis* which was shown by Linsdale (Pac. Coast Avif. No. 23, 1936:87) to range through northern Nevada.

Psaltriparus minimus.—The race *P. m. providentialis* was described by Arvey (Condor, 43, 1941:74) with a range embracing the Providence Mountains of southeastern California and the Charleston Mountains of southern Nevada. In less extreme form it also occurs in the White and Inyo mountains of California, intergrading there with *plumbeus*. The writer, in reporting on the Bush-tits of the Pine Valley Mountain area (Bull. Univ. Utah, 34(2), 1943:53) referred them to *P. m. plumbeus* but stated that they too showed intergradation with *providentialis*. Four December birds and two breeding specimens acquired more recently from the Kanab area of Kane County, show the principal character of *providentialis*, namely the pileum concolor with the dorsum. It seems best then to extend the range of the Providence Mountain race eastward to include southwestern Utah and central-southern Utah. A series of Bush-tits in the Museum of Vertebrate Zoology from the San Francisco Mountains in northern Arizona just south of the Grand Canyon are referable to *P. m. plumbeus* so the break or transition between the two races seemingly occurs rather abruptly in northern Arizona.

Certhia familiaris.—Three specimens from Kane County differ from examples of *C. f. montana* in being paler and grayer, especially on the wing coverts and under tail coverts. Thus they are referable to *C. f. leucosticta* described by van Rossem (Trans. San Diego Soc. Nat. Hist., 6, 1931:329) from the Sheep and Charleston mountains, Clark County, Nevada. These specimens were taken at the following places: head of Swain's Creek, 8000 feet, 9 miles northwest of Alton, June 26, 1947; edge of Long Valley, 10,000 feet, near south boundary of Cedar Breaks National Monument, 13 miles southeast of Cedar City, June 25, 1947; Tinny Canyon, 5600 feet, 3½ miles northwest of Kanab, December 30, 1946.

On geographic grounds, the creepers of the Pine Valley Mountains to the west should also be of the race *leucosticta*. The one specimen obtained by the writer in his field work there in mid-September (Bull. Univ. Utah, 34, 1943:54) is, however, referable to *montana* and is now presumed to be a transient rather than an example of the local population. Creepers from elsewhere in the state seem referable to *montana*.

Telmatodryas palustris.—The race *T. p. aestuarinus* has a peculiar distribution. As shown by Grinnell and Miller (Pac. Coast Avif. No. 27, 1944:340) it ranges throughout the Great Valley of California and, after a hiatus, along the Lower Colorado River val-

ley. Linsdale (Pac. Coast Avif. No. 23, 1936:93) extended the range up the Colorado River into southern Clark County, Nevada. It now appears that this race continues up into Utah along the Virgin River tributary of the Colorado. In the writer's field work in Washington County, Utah, no breeding Marsh Wrens were taken, but three autumn and early winter specimens were secured. These three specimens, all males, taken December 17 to 18, 1939, and September 11, 1941, about 3 miles south of St. George, 2800 feet, prove to be *T. p. aestuarinus*, although the one taken in September shows an approach to *plesius*. Presumably these specimens represent the resident population.

There is evidence that the race *aestuarinus* extends still farther eastward. A pair taken on March 3, 1946, at a cattail swamp in Cave Lakes Canyon, 5500 feet, 5 miles northwest of Kanab, Kane County, are intergrades toward *plesius*, but closest to *aestuarinus*. A male taken on December 28, 1946, along Kanab Creek, 4850 feet, 1 mile south of Kanab is *aestuarinus*. These three specimens suggest a sedentary population in the Kanab area as may also be the case along the Virgin River. A fourth specimen taken at Kanab on April 15, 1947, is an example of the race *plesius*. It could have been a migrant on that date and so not represent the breeding population.

Hylocichla guttata.—When the McCabes (Condor, 34, 1932:26-40) made their study of the western races of Hermit Thrushes, there was little material available to them to indicate the relationship, especially in Utah, between the races *polionota* and *auduboni*. Twenty-nine specimens have been collected since then in the state, of which nineteen are breeding birds. Apparently these two races do not differ in coloration, hence the wing and tail measurements of these Utah specimens are recorded here following the arrangement of the table in the McCabes' report (*op. cit.*:38-39).

	Males						
	Number	Min.	Mean	Max.	Min.	Mean	Max.
Wasatch Mts., E. Salt Lake City	2	102.2	102.2	102.2	76.0	76.3	76.6
Raft River Mts., NW Utah	2	98.6	100.3	102.0	73.8	75.7	77.6
Duck Creek, Cedar Mt., Kane Co.	4	99.0	99.2	99.5	71.4	73.5	75.4
Pine Valley Mts., SW Utah	5	98.4	100.2	104.7	72.4	76.1	80.8
Females							
Raft River Mts., NW Utah	1	.....	94.3	.....	.....	68.4	.....
Duck Creek, Cedar Mt., Kane Co.	2	94.0	95.9	97.9	69.6	72.2	74.8
Pine Valley Mts., SW Utah	3	92.8	96.5	99.4	71.8	72.1	72.4

These size data suggest that the thrushes from central-southern and southwestern Utah belong to the race *polionota*. The three specimens from the Raft River Mountains in the northwestern part of the state seem to be an instance of what the McCabes call the interlocking of *auduboni* and *polionota* size ranges, one male and the female falling closest to *polionota* while the other is an extreme of *polionota* approaching *auduboni*. The five breeding males from the Uinta Mountains in the northeastern corner of the state whose measurements are listed by Twomey (Ann. Carnegie Mus., 28, 1942:429) average about the same as the two Wasatch Mountain examples and so the Hermit Thrushes from these latter two areas represent *auduboni*. They are not, however, as large as the McCabes' representatives from Arizona.

Hylocichla ustulata.—Thrushes of this species are doubtless more common than specimens in collections indicate. Utah specimens were assigned by the writer to the race *H. u. almae* in his check-list largely on geographical grounds whereas Twomey (Ann. Carnegie Mus., 28, 1942:431) used the name *H. u. swainsonii* for his single specimen from the Uinta Basin. Seven birds recently acquired from the Wasatch Mountains east of Ogden and Salt Lake City (some from the western fringe of the Uinta Basin) are typical examples of the race *H. u. almae*.

Vireo gilvus.—When Oberholser (Sci. Publ. Cleveland Mus. Nat. Hist., 4, 1932:9) described the race *V. g. leucopolius*, he ascribed to it a range embracing the Warner Valley region of central-southern Oregon, north to central Oregon, and south to central-western Nevada. The race has been approved by Sibley (Condor, 42, 1940:255-258) and Miller (Condor, 43, 1941:263-264) who state that the range includes all the Great Basin and eastward to the east slope of the Rocky Mountains. The writer referred his Pine Valley Mountain specimens to this race (Bull. Univ. Utah, 34, 1943:62) and in his check-list of the birds of the state used the name *V. g. leucopolius* for the western Utah birds, intimating that those from the eastern part of the state may represent another race. Twomey (Ann. Carnegie Mus., 28, 1942:437) listed his birds under *V. g. swainsonii*.

A study of the 45 specimens of Warbling Vireos in the collection of the University of Utah indicates that the breeding birds represent only one race, namely *leucopolius*. They compare closely with topotypes of the race from the Warner Valley of Oregon. While I have not examined Twomey's series, University of Utah specimens from the northeastern portion of Utah (10 miles southeast of Kamas, 12 miles southeast of Heber, and 3 miles northwest of Strawberry Reservoir, all in Wasatch County, and Smith and Morehouse Creek, Summit County) are the gray-backed type known as *leucopolius*.

While *leucopolius* is the breeding form, apparently examples of *V. g. swainsonii* occur in Utah during migration. A specimen from the King Ranch, Henry Mountains, Garfield County, taken on September 10, 1929, and one from the Deep Creek Mountains, Juab County, taken on September 16, 1947, have olive-green backs rather than gray and the sides of the belly and flanks have much olive-yellow. Thus they appear to represent *swainsonii*.

Dendroica petechia.—The race *D. p. morcomi* was described by Coale (Bull. Ridgway Ornith. Club. No. 2, April, 1887:82) with type locality at Fort Bridger, Wyoming. The race was later discarded as Grinnell pointed out (Condor, 5, 1903:71) in his review of the subsequent history of the race when he named the form *brewsteri*. In describing the Californian population west of the Sierra Nevada, Grinnell considered *morcomi* a synonym of *aestiva* which was thus supposed to include in its range the Rocky Mountains and the Great Basin. Of more recent date, van Rossem (Trans. San Diego Soc. Nat. Hist., 6, 1931:283) has stated his belief that a Rocky Mountain race of yellow warbler was worthy of recognition, an opinion apparently shared by other western systematists until Twomey (Ann. Carnegie Mus., 28, 1942:440) pointed out the similarity of Rocky Mountain and Pacific coast birds.

In the writer's field work there has accumulated almost 90 breeding specimens, mostly males, from several localities in Utah. This material shows the coloration of the Utah birds to be duller, less yellowish green than in *aestiva*, a circumstance that van Rossem pointed out and to which Twomey agrees. The breast streaks are narrower and more indistinct than in *aestiva* as Twomey noted for his birds. As compared with Pacific coast examples, van Rossem thought the Rocky Mountain birds had heavier breast streaking. I find the Utah and California birds identical both in dorsal coloration and ventral streaking.

Concerning size, van Rossem thought Rocky Mountain Yellow Warblers to be slightly larger than *aestiva* and decidedly larger than *brewsteri*. Twomey found his Uinta Basin birds to be slightly less in wing measurement and the tails slightly longer than *aestiva* but similar to *brewsteri*. Ridgway (Birds North and Middle America, 2, 1902:509) commented many years ago in a footnote that western examples have shorter wings and longer tails than eastern representatives. The size of the wing and tail of males from Utah are given in the accompanying table.

Place or race	Number	Min.	Wing Mean	Max.	Min.	Tail Mean	Max.
<i>Dendroica p. aestiva</i> (from Twomey)	0	61.0	63.0	67.5	40.6	43.5	46.0
Uinta Basin, Uintah Co., Utah (from Twomey)	12	58.0	61.9	63.0	43.0	45.5	47.6
5 mi. N. Ibapah, Tooele Co., Utah	10	60.0	61.9	63.7	44.2	46.6	51.8
Antelope Island and adjacent area, Salt Lake Co., Utah	7	58.1	60.7	62.7	44.1	45.8	47.5
Midway, Wasatch Co., Utah	18	58.0	60.8	63.0	43.3	45.6	49.0
St. George and adjacent area, Washington Co., Utah	20	58.5	61.2	64.0	44.0	46.1	48.3
Kanab, Kane Co., Utah	15	56.5	60.0	63.3	43.3	45.1	47.6
<i>Dendroica p. brewsteri</i>	40	58.0	61.0	63.6	43.7	45.9	48.1

All the Utah birds from various localities measure essentially the same and are exceedingly close to 40 males that the writer measured in the Museum of Vertebrate Zoology from the area ascribed to *brewsteri*. On the basis of Twomey's sample for *aestiva*, the Rocky Mountain-Great Basin-Californian Yellow Warblers have slightly shorter wings but longer tails.

The evidence indicates then that the Utah birds are not of the eastern race *aestiva*, but are identical with California birds called *brewsteri*. Thus I am brought to the same conclusion as Twomey that *brewsteri* appears to be a synonym of *morcomi*. While I have not seen the type of *morcomi* nor compared it with examples of *aestiva*, the statement of Brewster (see Grinnell, *op. cit.*) that he and Ridgway agree in considering the type of *morcomi* "merely an exceptionally faintly streaked specimen of *aestiva*" indicates that it typifies the western population, as indeed it should from its locality. Topotypes of both the races *brewsteri* and *morcomi* have been seen by the writer and are the same in their characters.

I should like at this time to reiterate my belief that the race *sonorana* does not occur in Utah, even though Woodbury (Bull. Univ. Utah, 35(14), 1945:122) considers this to be a common breeder along the San Juan and Colorado rivers. His specimens assigned to this race are few in number and badly worn adults or immatures. The lack of streaking on some specimens may indicate an approach to *sonorana* but the dorsal coloring insofar as can be determined is considerably darker and so indicative of *morcomi* affinities. I can not agree to assigning the migrants to *morcomi* and *brewsteri* and the breeders to *sonorana*.

Geothlypis trichas.—In connection with the recent description of *G. t. campicola* of the northern Rocky Mountains-Great Plains region (Behle and Aldrich, Proc. Biol. Soc. Wash., 60, 1947:69-72) the statement was made that the winter range was undetermined but that representatives of the race occur southward in migration in Utah, Colorado, and Arizona. The basis for the reference to Utah in this connection is two specimens. One was taken on March 15, 1940, at the Wendover Bombing Range, 4200 feet, Wendover, Tooele County, Utah. It was one of a migrating flock. The second specimen was taken 3 miles south of St. George, 2800 feet, Washington County, Utah, on May 14, 1940. Thus the race *campicola* is to be added to the state list along with *occidentalis* and *scirpicola*.

Agelaius phoeniceus.—The distribution and characters of the Redwings in Utah have been discussed by the writer (Wilson Bull., 52, 1940:234-240). Subsequently, in the check-list of Utah birds, *A. p. nevadensis* was listed with reservations on the basis of extreme individuals cropping up in populations of *utahensis* or *fortis* and the suggestion was made that *nevadensis* would probably be found to be the race occurring in central-western and northwestern Utah near the Nevada border. In May, 1942, a series of 10 breeding birds was taken 5 miles north of Ibapah, Tooele County, which is close

to the Nevada border, and on June 23, 1946, a single male was collected at Fish Springs, Juab County, Utah. All these Redwings seem referable to the race *nevadensis*, chiefly on the basis of the orange-red epaulets and longer, slenderer bills. They are not typical of *nevadensis* but are suggestive of intergradation with *utahensis*. For instance, the specimen from Fish Springs has a *nevadensis*-type bill but its darker red bend-of-wing is like that which characterizes *utahensis*. Despite one's feelings as to whether or not the extreme *nevadensis*-like specimens occurring in *utahensis* populations should be referred to the former race, here is evidence that the race *nevadensis* does occur in Utah as an atypical breeding population on the western margin of the state.

Carpodacus mexicanus.—Until the time of Moore's revision of the house finches of the subgenus *Burica* (*Condor*, 41, 1939:177-205) and his description of two races, *Carpodacus mexicanus solitudinis* from the Great Basin and *C. m. grinnelli* from the Pacific Coast strip (*Proc. Biol. Soc. Wash.*, 52, 1939:105-112), the house finches of Utah and all of the western states were considered as belonging to one form, *C. m. frontalis*. Moore restricted this race to the general region of southern Colorado and New Mexico.

As pertains to Utah, Moore had 17 males and 10 females from several localities scattered over the state. He did not place them within the range of any race but indicated that they were intergrades between *solitudinis* and *frontalis*. The writer has accumulated several series totaling about forty breeding males from various localities in the state in recent years. Study of this material indicates that the finches of the west desert region differ slightly from those of eastern and southeastern Utah.

A series of nine males taken in the third week in May at a point 5 miles north of Ibapah, Tooele County, in the western desert section, when compared with twelve males collected in late May in the vicinity of Kanab, Kane County, have the posterior underparts a little whiter and the red of the anterior underparts less extensive. Thus the Ibapah specimens conform at least in part to Moore's characterization of *solitudinis* and the Kanab series to *frontalis*. In addition, the red coloring especially of the forehead, is brighter in most individuals of the Ibapah series whereas the Kanab representatives tend to have a darker red. Similar to the Kanab birds are a few specimens from Bluff, Moab, and other localities in southeastern Utah. A series of nine May-taken finches from the St. George-Beaverdam Wash area are variable individually and fit in as a group as well one way as another. Wing and tail lengths average essentially the same in all the Utah samples.

It appears that a situation exists in Utah between "*solitudinis*" and *frontalis* that is similar to the situation in California between "*solitudinis*" and "*grinnelli*." As Grinnell and Miller (*Pac. Coast Avif.* No. 27, 1944:454) put it, there seems to be a type of incipient or imperfect geographic differentiation shown. Extreme variants from the potentially different populations are recognizable but when only about fifty per cent of the specimens can be segregated into one or the other category, the taxonomic practicability of recognizing two geographic races in Utah is open to question.

Melospiza melodia.—In a recent note, Twomey (*Condor*, 49, 1947:128) on the basis of a single specimen taken in early August from Hill Creek, 40 miles south of Ouray, on the East Tavaputs Plateau, Uintah County, Utah, advocates the extension of the range of *M. m. fallax* to the southern edge of the Uinta Basin. Militating against this is the circumstance that a series of seven Song Sparrows from Moab and vicinity taken in April (see Behle, *Wilson Bull.*, 53, 1941:184) are dark and presumably represent the Mountain Song Sparrow now known as *M. m. montana*. They may not have been breeding birds but when collected behaved as though they were on their breeding grounds. More pertinent evidence is found in twelve breeding Song Sparrows (May-June) re-

cently acquired from the Kanab area which is out of the Virgin River drainage and about fifty-five miles east of the type locality of *M. m. virginis* (now synonymized under *fallax*). These birds are intergrades between *fallax* and *montana* but closest to the latter. Twomey's specimen may be an individual variant of *montana* resembling *fallax* or there is possibly another explanation. There are in the collection of the University of Utah several specimens from northern Utah taken in the fall that have light brown backs. These at first appear similar to *fallax*. This character, however, seems to reflect the influence of the more northern race *merrilli* which has brown centers in the feathers of the dorsum. The brown is less reddish than in *fallax* and of course there are other characters that distinguish *merrilli*. Twomey's specimen may be another one of this "*montana* toward *merrilli*" type of Song Sparrow.

Department of Biology, University of Utah, November 15, 1947.

SPRING ARRIVAL OF SUMMER RESIDENTS IN THE BERKELEY AREA,
CALIFORNIA

By HENRY G. WESTON, JR.

Bird students are usually only vaguely aware of the orderly sequence of arrival dates of summer-resident birds in a given area. They know merely that certain species may be expected to appear at certain times each year. If data are compiled and graphically presented, it becomes possible to evaluate year-to-year differences within one species and to make comparison between species.

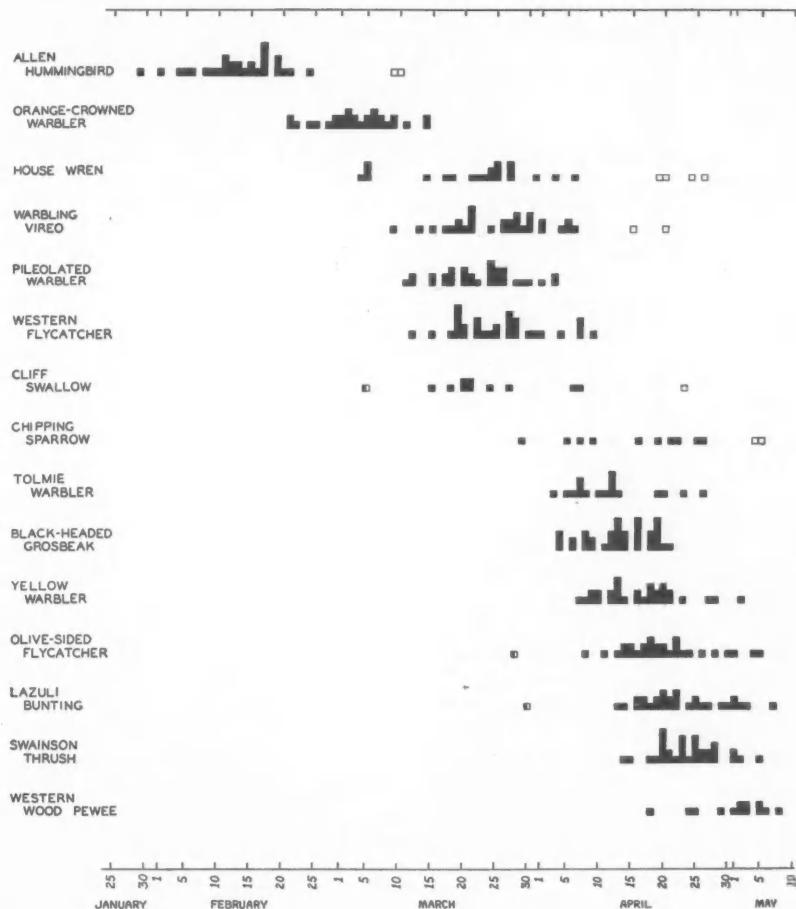


Fig. 21. Comparison of dates of spring arrival of summer residents in the Berkeley area, California. Solid black squares indicate first-seen records; half-black squares, probable early vagrants; open squares, doubtful first-seen records.

In figure 21, I have recorded graphically the dates of the first-seen records for the fifteen most common summer residents in the Berkeley area, on the east side of San Francisco Bay opposite the Golden Gate. All records shown are based on observations and field notes of various ornithologists. The years 1911 through 1947 are covered. My own observations for the last three of these years have been included.

I have a complete record for the 37-year period for only one species, the Black-headed Grosbeak. Nine other species are recorded for 30 or more years; the remaining five for less than 30. These latter five species, the House Wren, Cliff Swallow, Chipping Sparrow, Tolmie Warbler and Wood Pewee, have been recorded fewer times for various reasons. The Cliff Swallow, for example, has been erratic at times, failing to appear in Berkeley in certain years. The other four species are either secretive in their habits or appear only in low numbers most years. Consequently, they are not always recorded at the time of first arrival. On rare occasions certain species have been recorded much earlier than they normally appear in Berkeley; in instances of exceptionally late records, it has been assumed that actual first arrivals were overlooked or not sought out.

It is hoped that this article will stimulate other students to record data on migration in a form more usable than is commonly done today. Many amateur ornithologists have such data buried in field notes. Presenting these data as I have done here will enable others to benefit from them and will call attention to problems which field observers can help to solve.

Museum of Vertebrate Zoology, Berkeley, California, June 30, 1947.

FURTHER OBSERVATIONS ON VARIATION IN CANYON WRENS

By ALDEN H. MILLER

The Canyon Wrens (*Catherpes mexicanus*) of the western United States have proved to be a most troublesome group with respect to racial taxonomy. Great amplitude of individual variation in any one population coupled with small series of available specimens are the sources of difficulty. The two most careful considerations of this problem of variation in recent years appear to have been those of Grinnell and Behle (Condor, 37, 1935:247-251) and Behle (Bull. Univ. Utah, 34, 1943:56-67) in which, however, opposing nomenclatural representations of geographic variation were advocated.

The later paper of Behle, based on some new material, particularly from Utah, portrays a pattern of variation which my current review of the group largely confirms. In brief, the wrens from California west of the Sierra Nevada are usually rich, dark brown dorsally. In the Great Basin and in the southern deserts coloration is exceedingly variable, with many paler, tawny- or gray-backed birds appearing. Apparently, as Behle has reported, in eastern Nevada and Utah pale and tawny, rather than rich brown, coloration predominates; I am not prepared to say from personal observation that this type of coloration is uniform there. In Colorado and Arizona, richly brown birds again appear, many of them like those of coastal California.

Behle has stated that along the eastern escarpment of the Sierra Nevada the separation of the dark and pale birds is rather abrupt. This I think is something of an exaggeration. Recently I have taken samples from the Inyo district east of the Sierra and from the western Sierran slopes and western California, including some new material from San Luis Obispo County, and have mixed seasonally comparable material to test the feasibility of separating geographic groups on the basis of color. I find that only about three-fifths of the total of 60 specimens can be correctly separated by this means; there seem to be no other useful characters available.

Behle (1943) advocated use of names for the extremes of color differentiation, namely the rich brown type in western California and the pale type in Utah, recognizing that there is a zone of intergrades or of mixed-type birds of great magnitude between them which occupies much more ground than do the extreme populations. This would be a reasonable proposal were it not for other complications. But mixed groups occur across the northern Great Basin (see beyond), not in a line of intergradation between California and Utah, and similarly to the southward in the deserts of California and in Arizona, and again to the east of Utah. Moreover we are not yet in a position to define the geographic limits of the uniform pale population in Utah and we certainly are not able to define an area where the rich-brown bird predominates on the west coast; such a color type is not uniformly present there.

Some further nomenclatural difficulties arise in the application of existing names. *Punctulatus* (Ridgway, Proc. U. S. Nat. Mus., 5, 1882:343) would be available, as in the past, for the birds of coastal California, but *conspersus* (Ridgway, Amer. Nat., 7, 1873:603) is dubiously applicable to the pale tawny birds of Utah. The type of *conspersus* according to Behle, who has examined it, is a pale tawny bird like those of Utah. Yet this name should probably not be used for the Utah extreme as Behle has done in disregard for the population of western Nevada, of which the type was a part, and which is a mixed sort of population, representing a mid-segment of the color gradation between California and Utah. As shown by the trial sorting already reported, birds east (*conspersus*) and west (*punctulatus*) of the Sierran crest are not separable in large enough degree to make nomenclatural distinction of them useful. Problems similar to

those presented by *conspersus* and *punctulatus* arise in the use of the names *polioptilus* (Oberholser, Auk, 20, 1903:197) and *meliphonus* (Oberholser, Sci. Publ. Cleveland Mus. Nat. Hist., 1, 1930:95), as indicated by comments of Hellmayr (Cat. Birds Amer., part 7, 1934:277-278) and van Rossem (Occ. Papers Mus. Zool., Louisiana State Univ., no. 21, 1945:191).

Aldrich (Proc. Biol. Soc. Wash., 59, 1946:129-136) recently has given the name *griseus* to the Canyon Wrens of eastern Washington and eastern Oregon, contrasting them with *conspersus*, as "more grayish, less rufescent." They are stated to be "paler and more grayish" than *punctulatus*. Behle (1943) characterized material he examined from the desert region of [eastern] Oregon in the Jewett Collection as "a variable lot of intergrades linking *punctulatus* with *conspersus*." I have not seen many specimens from this northern interior area, where *griseus* is supposed to differentiate, but those I have examined point to the correctness of Behle's characterization of them. For example, two birds in the collection of the Museum of Vertebrate Zoology from the adjoining Modoc region of California are to be matched among specimens from western Nevada and the Inyo district as is one from Twin Falls County, southwestern Idaho. Three birds from the Brooks Collection taken almost at the Washington border in the Okanagan Valley of British Columbia are generally dark. One in fresh plumage is indistinguishable from birds of the western slopes of the Sierra. Two in worn plumage are dark and gray and scarcely conform to Aldrich's characterization of *griseus*. One of these at least can be matched by dark gray variants from western California. Thus the impression is gained that *griseus* is no more, and probably less, satisfactorily separable as a race than is *punctulatus*.

There now remains another, and again incomplete or erratic, differentiation to report in this species. Canyon Wrens were found in the pine hills area of Powder River County, Montana, in late June of 1947, where to my knowledge the species has not heretofore been collected. It has been seen near Billings, Montana (Welch, Auk, 53, 1936:231) and has been taken in northeastern Wyoming and in the Black Hills of South Dakota (Brodkorb and Hinshaw, Auk, 55, 1938:554-555). Four adults and five juveniles were taken by our party from the Museum of Vertebrate Zoology two miles west of Fort Howes Ranger Station in Powder River County. These with the two adults and two immatures taken by Brodkorb, and kindly loaned by Josselyn Van Tyne of the Museum of Zoology of the University of Michigan, give a fair basis for judging the characters of the Canyon Wrens of the northeastern limits of the range of the species in the Great Plains. Four of the six adults are strikingly pale ashy on the anterior upper parts and are grayer and much lighter dorsally in general than are examples from the Great Basin. Two, however, one from Fort Howes and the other from 3 miles east of Newcastle, Wyoming, can be matched by the paler third of the series from the Inyo and Mohave desert areas. The juveniles are less strikingly different, yet most are paler or ashier than comparable examples from the Great Basin. One fresh-plumaged adult from Eagle Mountain, eastern Riverside County, California, is pale ashy gray and probably would match the palest type of bird from Montana when in worn spring condition.

In summary, the Canyon Wrens of the United States north and west of Texas present a mosaic of individual and local variation in which there are several restricted areas where one color type reaches a fairly high frequency of occurrence. Dark, rich brown color predominates in places on the Pacific coast, pale tawny predominates in sections of Utah, and ashy gray in the northern high plains. I am less sure that there is a distinctive gray type in eastern Washington and Oregon; such a type is certainly not the extremely light ashy variant of the plains. Between these weak foci of differentiation are great areas occupied by individuals of several color types in variable proportion.

There are no clear cut clines. It would be a mistake to conclude from what has been said that average color grades regularly from dark in coastal California through progressively paler values in Utah to an extreme in South Dakota. Rather the fluctuations in color are spotty or local; reversals of trends, as in the Rocky Mountains of Colorado, seem to occur.

The pattern of variation does not lend itself to nomenclatural designation. To apply racial names such as *punctulatus*, *conspersus*, *griseus* and *polioptilus* to the differentiations of low consistency and uncertain geographic limits which prevail calls for a high number of arbitrary and unreal decisions—rather more than the racial taxonomist normally must rationalize. The better course in the Canyon Wrens is to use one name, *C. m. conspersus*, the oldest, for this variable complex. This name was based on a population of mixed color type and appropriately it may remain applied to such on a broad scale. There is general agreement with the factual picture presented by Behle (1943), supplemented by knowledge of a further local trend in variation in the high plains. Only, then, in the nomenclatural treatment of this peculiarly variable group, do I hold a counter opinion; in short, I advocate the nomenclatural solution of Grinnell and Behle of 1935 which seems the most sensible and useful.

Perhaps in danger of being obscured by the effort to devise a racial taxonomy for Canyon Wrens are at least two points of general biologic significance. First, the variability of the color of the darker parts of this species in any one region points to a low rate of natural selection for these colors. Second, pairs of these wrens usually are widely spaced because suitable habitat is scattered; accordingly some of the young must disperse extensively to find breeding territories and mates. This dispersal, which I think is greater than has generally been realized, operates, doubtless in connection with weak selection, to maintain high variability and offset tendencies completely to fix one color type in a particular area.

Museum of Vertebrate Zoology, Berkeley, California, January 23, 1948.

THE WINTER RANGE OF THE KENNICOTT WILLOW WARBLER

By KENNETH C. PARKES and DEAN AMADON

According to Ridgway (1904), the Kennicott or Alaska Willow Warbler (*Phylloscopus borealis kennicotti*) migrates in winter to southeastern Asia, "but by what route and to what countries not yet determined." More recent manuals, such as those by Delacour and Mayr on the birds of the Philippines, Delacour on the birds of Malaysia, and Deignan on the birds of northern Siam, do not mention this race. The A.O.U. Checklist (1931) merely states that this bird winters in southeastern Asia, this statement being repeated word for word by Hellmayr (1934). Ticehurst (1938) had not seen sufficient material of *kennicotti* to be sure of its validity but stated that he had examined migrants or winter residents of this species from Amoy, China; Tenasserim, Burma; Penang, Malay Peninsula; Siam and the Philippines which, because of their small size, might be of this race. In view of the now well established smaller size of the Alaskan race, we believe that these specimens mentioned by Ticehurst may be considered definite records of *kennicotti*, in addition to those given below.

The small size of certain Philippine, winter-taken specimens of *Phylloscopus borealis* in the collections of Cornell University and the American Museum of Natural History led us to suspect that they might be referable to *kennicotti*. Amadon and Jewett (1946) have commented briefly upon this possibility. Consequently a study was undertaken of a series of winter and migrant specimens of *Phylloscopus borealis* in an effort to delimit more precisely the winter range of the Alaskan form.

We have relied principally upon Ticehurst's excellent monograph (1938) as a guide to the characters differentiating the various races of *P. borealis*. Wing length (measured flat) has been the chief criterion employed, as color characters are largely unsatisfactory in this species unless large series, strictly comparable as to state of plumage, are available.

The smallest of the races of *Phylloscopus borealis* is the Alaskan form, *kennicotti*. Two males from Norton Sound, Alaska, the type locality, measure wing 63 mm., 64 mm., which agrees well with measurements for this race given by Ticehurst. The next larger race, and the only one which could be confused with *kennicotti*, is *borealis*. A series of twelve breeding birds from Siberia, mostly from the Lena River region, was chosen as typical of the latter race for purposes of comparison. These were carefully measured and were found to agree well with Ticehurst's measurements. Of several hundred examples of *P. b. borealis* examined by Ticehurst, no male had a wing shorter than 65 mm. Our smallest males of this race measure wing 66 mm. (two specimens). We have therefore referred the males from our winter series with wing less than 65 mm. to *kennicotti*. Two males with wing 65 mm. must be considered intergrades, although we feel that they are more probably large *kennicotti* than small *borealis*, since only exceptional individual males of *borealis* have wings as short as 65 mm.

Twelve male specimens (wing, 60-64; average, 62.2 mm.) we consider to be definitely *kennicotti*. Of these, five were taken on Luzon, Philippine Islands, during the months of September, October, January, March and April. The September specimen was apparently in the act of migrating (September 30, 1945), since it was captured on shipboard in Subic Bay, Luzon. Of a total of thirty Philippine specimens, including male, female and unsexed birds, we assign twelve (Luzon; Palawan) to *kennicotti*. Other non-breeding localities from which we have seen specimens referable to *kennicotti* include eastern China (Shantung; Yunnan), peninsular Siam (Nongkok), Malay Peninsula (Kedah Peak), Celebes and Selayer Island (south of Celebes). The two male specimens with

wing 65 mm. mentioned above, referred provisionally to *kennicotti*, are from Luzon, P.I., and Buru Island, Moluccas, respectively.

Although two-fifths of our Philippine specimens of *Phylloscopus borealis* are *kennicotti*, only three of 55 specimens from the East Indies seem to be this race, and the percentage in southeastern Asia is perhaps equally low. It seems reasonable, therefore, to assume that the Philippine Islands represent an important, if not the principal, wintering area for *kennicotti*. Careful study of winter specimens of this species from throughout the Malaysian region and Indo-Chinese countries should produce more records of the Alaskan race.

In addition to *borealis* and *kennicotti*, the two remaining subspecies of *Phylloscopus borealis* also winter in this general area. These two races, *examinandus* and *xanthodryas*, cannot be confused with *kennicotti*, since both are even larger than *borealis*.

The dates of the three specimens from eastern China (April 5, May 20, September 11) clearly indicate that this area lies on the migration path of the Alaska Willow Warbler. Whether this represents the main route or only an outlying sector remains to be determined. One would expect those birds going to the Philippines to pass through Japan and Formosa, but the various Japanese hand-lists do not mention this race. It may have been overlooked, as it is a somewhat yellowish race, as is *xanthodryas* of Japan. The seven Japanese specimens we examined are not *kennicotti* with one possible exception, nor is one specimen from Formosa of this race. The two specimens of *kennicotti* from peninsular Siam and Malaya are midwinter records (January 4, December 7).

We conclude, therefore, that the winter range of *Phylloscopus borealis kennicotti* might be described thus: "Winters commonly in the Philippine Islands and sparingly in the Indo-Chinese countries, Malaysia and the East Indies east to the Moluccas; known to migrate through eastern China (Shantung; Yunnan)."

LITERATURE CITED

Amadon, D., and Jewett, S. G., Jr.
1946. Notes on Philippine birds. Auk, 63:541-559.

American Ornithologists' Union
1931. Check-list of North American birds (Lancaster, Pa., Amer. Orn. Union), 4th ed., xx + 526 pp.

Hellmayr, C. E.
1934. Catalogue of birds of the Americas and the adjacent islands. Field Mus. Nat. Hist., Zool. Ser., 13:vi+531 pp.

Ridgway, R.
1904. The birds of North and Middle America. U. S. Nat. Mus. Bull. 50, part 3:xx+801 pp.

Ticehurst, C. B.
1938. A systematic review of the genus *Phylloscopus* (London, British Museum), viii+193 pp.

Laboratory of Ornithology, Cornell University, Ithaca, New York, and American Museum of Natural History, New York, New York, December 5, 1947.



BLACK-CAPPED CHICKADEES
Sketches by Allan Brooks

FROM FIELD AND STUDY

Returns of Banded California Brown Pelicans.—Early returns of pelicans banded at Anacapa Island, Ventura County, California, in April, 1939, and May, 1940, were reported by me in 1942 in the Condor (44:116-121). Since that time eight additional returns have come in as follows, all but the last one banded on May 15, 1940.

How obtained	Date	Place
Shot	"Season, 1942"	4 miles S San Rafael, Calif.
Found injured	May 22, 1944	Emerald Bay, Laguna Beach, Calif.
Found dead	Aug. 22, 1944	Near Ferndale, Calif.
Shot	Jan. 1, 1945	About 4 km. from mouth of Rio Acaponeta, Nayarit, Mexico
Found	April 30, 1945	Ensenada, Baja Calif., Mexico
Dead on beach	Nov. 4, 1945	Santa Cruz, Calif.
Caught on fish hook	About April 1, 1947	Huntington Beach, Calif.
Found dead	Jan. 4, 1946	Between Coronado and Imperial Beach, Calif.

Thus 8 (7.62 per cent) of the 105 nestlings banded on April 16, 1939, and 63 (14.00 per cent) of the 450 banded on May 15, 1940, have been returned. The localities reported are all within the range established by the early returns. The oldest birds so far heard from are the last two listed here: 6 years and about 11 months, and 6 years and about 9 months, respectively.

The bird found at Ensenada may possibly have been nesting in the vicinity, but the question of whether or not there is any attachment to the natal colony is not answered by these returns.—R. M. BOND, Soil Conservation Service, Portland, Oregon, December 22, 1947.

The Starling Appears at Leevining, Mono County, California.—On December 8, 1947, following a snowstorm in the night in the Mono Basin, Mr. Ralph V. Beck, of Leevining, California, reported to the writer the occurrence of several "strange-appearing" birds in his backyard. They fed during the forenoon on breadcrumbs placed on a box about six feet from his office window. Five in number and about the size of a Robin, the dark-colored, profusely light-speckled birds were unlike any he had ever seen. The next day, a flock of about a dozen flew low over the yard. From the description given, I inferred that the birds were Starlings (*Sturnus vulgaris*); on December 10 their reappearance at the improvised feed station while I was at Mr. Beck's residence confirmed this. The Starlings fed eagerly at the station at intervals from 11:30 a.m. to 12:15 p.m., and at one time, while seven fed at or near the station, five more loafed in a "close-ordered" row in the sunlight on a power line a block away. Subsequently the Starlings apparently disappeared, and since have not been seen anywhere in the Mono Basin.

Starlings have previously been reported in California from Tule Lake, Siskiyou County, Death Valley, Inyo County, at Chino, San Bernardino County (see Stager, Condor, 49, 1947:169) and in the Colorado River valley (Monson, Condor, 50, 1948:45). The occurrence herein reported is believed to be the first for the Mono Basin and Mono County.—ELDEN H. VESTAL, California Division of Fish and Game, June Lake, Mono County, California, January 6, 1948.

The Effect of DDT on a Bird Population.—At the sewage disposal plant at Modesto, California, are some 20 acres of settling ponds. From August to April such shorebirds as Least, Western and Spotted sandpipers, phalaropes, Black-necked Stilts, Avocets, Wilson Snipe, Dowitchers, Yellow-legs and Killdeer move in and out of the area. Pipits are often present and usually hundreds of Brewer Blackbirds are there at all seasons. For ten years or more I have used part of this area as a banding station, and for five years or so a mosquito abatement group has been giving the area some attention. Until 1946 the group generally used an oil sprayed on the ponds and applied it with a hand-operated rig, but in 1947 it used DDT and power equipment. In the summer an airplane duster was used until it crashed, whereupon a tank-truck with hundreds of feet of hose took over. About September 15 an intensive campaign with the tank-truck was begun. The area was sprayed about every five days with DDT; treatment covered not only the ponds, but the heavy vegetation about some of them. In addition to that, aerosol fog machines put a cloud over the area about equal to a low tule fog.

At the beginning of this all-out control effort there were from 300 to 400 Least Sandpipers, the usual 40 to 50 Killdeer and 800 to 1000 Brewer Blackbirds feeding in the area. By October 15 the sandpipers had dwindled to 6 or 8 and the Brewer Blackbirds to a couple of dozen. About November 1 Wilson Snipe and Pipits showed up as usual, but few of them stayed and those few did not inhabit the heavily sprayed area, but instead used ponds which were dry at the time of spraying or open ditches of running water. On January 3, 1948, I saw 4 Wilson Snipe instead of the 30 or 40 which are usual at this season; there were no Pipits, which as a rule equal the Wilson Snipe in numbers. There were 10 Least Sandpipers as against the normal 300 to 500. Killdeer and blackbirds were absent whereas there normally are 100 to 300 Red-wings and 500 to 800 Brewers.

The oilings of previous years from the hand-operated sprayers had no visible effect on bird life, but the all-out DDT-aerosol treatment seems to have obliterated insect life in the treated area. Although a flock of seed-eating Lark Sparrows disappeared after the sprayings, White-crowned, Golden-crowned and Lincoln sparrows and other seed eaters which came in afterward are apparently as numerous as in former years. However, there was some rainfall between the last spraying and the appearance of the migrating sparrows. From these observations it is concluded that such mosquito control measures destroy all, or nearly all, the animal life used as food by the birds above the surface, in the water and in the mud of areas which are treated. I saw no dead birds about nor signs of direct harmful effect on them.—IRL ROGERS, Modesto, California, January 15, 1948.

A Record of *Tyrannus melancholicus occidentalis* for California.—On October 1, 1947, I was awakened at 6:00 a.m. at my home in Berkeley, California, by the unfamiliar notes of a flycatcher. The bird was perched on a telephone wire, when not darting into the air in characteristic flycatcher fashion. The bird was collected, and subsequent identification by Alden H. Miller proves it to be the tropical kingbird *Tyrannus melancholicus occidentalis*, the first record for the state and the second record north of the Mexican border. Van Rossem (*Condor*, 31, 1929; 182) records a specimen taken in Jefferson County, Washington. The normal range of this race is the west coast of Mexico, from Sinaloa southward. The specimen is no. 97666, in the collection of the Museum of Vertebrate Zoology.—WARD C. RUSSELL, Museum of Vertebrate Zoology, Berkeley, California, January 6, 1948.

Notes on Behavior of the Turkey Vulture and Prairie Falcon.—On March 31, 1942, Mr. Leland Brown and I spent the day in the piñon-juniper association of Pipes Canyon on the desert side of the San Bernardino Mountains, California. About 3:30 in the afternoon while we were sitting in camp we heard a strange, loud, swishing noise which came from the opposite side of the canyon. Jumping to our feet to see what was happening we saw two Turkey Vultures (*Cathartes aura*) falling earthward just above the edge of the embankment. Our first impression was that they were fighting but soon we saw that one bird was astride the other and that the upper bird held on to the head of the lower with its beak. The noise we heard may have been made by the beating of the male's huge wings as he attempted to get hold of the other bird. As the paired birds fell downward they struck a small ledge; then while still fluttering their wings they fell farther down the stone-covered slope some thirty feet before reaching a landing on a small ledge. As the boulders, gravel and clay which the birds loosened plunged downward, there was caused no inconsiderable uproar and not a little dust. For a moment the birds remained almost motionless; then the male loosed his hold. With a few leisurely flaps of his broad wings he now rose gracefully and flew away. The female lay dazed and prostrate and with the left wing widely extended downward. After a few moments she flapped the extended wing a few times, pulled herself together, ruffled her feathers, and rose into mid-air. She immediately flew up-canyon. The male meanwhile was soaring high above watching her. Soon he joined her and the two flew westward out of sight.

On March 9, 1947, I visited the Negro Buttes with Edward Hamilton. These buttes are picturesque granitic formations of the southern Mohave Desert a few miles north of the San Bernardino Mountains. Some of the giant rocks rise more than a hundred feet above the plain and offer ideal nesting sites for the larger birds of prey as well as for ravens. About nine o'clock in the morning we heard the clear wild cries of a pair of Prairie Falcons (*Falco mexicanus*) and a few minutes later spied one of the birds, which later proved to be the female, sitting motionless in the sunshine atop a large granite dome. This place, judging from the amount of white fecal streaking on its side, had long been used as

a lookout station by birds of prey. The bird's cries suddenly became more spirited and frequent. A few seconds later we saw another falcon wheeling in toward her. It was soon evident that this was the male. Without any preliminary display by either bird, other than the crouching of the female, the male sailed gracefully down and mounted her; coitus immediately followed. During the coital act the wings of both birds were high upraised and rapidly and excitedly fluttered. Copulation lasted about ten seconds. Then the male dismounted and flew away, leaving the female perched on the rock. There she remained for more than half an hour with scarcely a motion. From time to time we heard her cries but the male did not return—EDMUND C. JAEGER, *Riverside College, Riverside, California, November 30, 1947.*

Winter Occurrence of the Harlequin Duck in the Sacramento Valley.—On January 4, 1948, in the late morning, while driving through the Sacramento National Wildlife Refuge, Glenn County, California, I saw a small flock of ducks take to the air and fly over the road about 25 feet in front of the car. This group consisted mostly of Mallards and Baldpates with a few Pintails intermixed. A single duck, flying somewhat apart from the main group and nearest to the car was immediately identified as a male Harlequin Duck (*Histrionicus histrionicus*). I followed this bird for several seconds, until he landed in an adjacent pond and was obscured by the glare of the sun. According to Grinnell and Miller's "Distributional List of the Birds of California" (Pacific Coast Avifauna No. 27, 1944:87), the Harlequin Duck breeds in the central Sierra Nevada and winters on the central California coast, and although this duck must pass between these two areas, no record from the intervening Sacramento Valley has been reported.—PAUL A. DEHNEL, *Museum of Vertebrate Zoology, Berkeley, California, January 9, 1948.*

White Pelican and Ring-necked Duck in Humboldt County, California.—On the morning of September 11, 1947, three White Pelicans (*Pelecanus erythrorhynchos*) were noted flying over the edge of the northern arm of Humboldt Bay, California. On the afternoon of the same date, the three were again noted high up over the Samoa Channel of Humboldt Bay. On the morning of September 14, 1947, a single one flew over Eureka and the Eureka Channel of the bay.

A single Ring-necked Duck (*Nyroca collaris*) was closely observed at Big Lagoon, Humboldt County, California. The bird, a male, was swimming and diving parallel to the highway bridge which spans the lagoon. Although there was considerable traffic on the bridge, and the observer hung over the rail, the bird appeared undisturbed and remained within fifteen to twenty feet of the bridge.

Both these species are recorded from many parts of the state of California, but there seem to be no data on them from this northern coastal region.—ROBERT R. TALMADGE, *Eureka, California, December 17, 1947.*

Behavior of the Gila Woodpecker, Ruby-crowned Kinglet, and Broad-tailed Hummingbird.—When parent Gila Woodpeckers (*Centurus uropygialis*) virtually gorged their young with thick, granulated honey that was placed in a saucer on a sycamore stump, I thinned the honey to the consistency of syrup. Not so easily scooped, the liquid was fed by the male parent in a clever manner. He gouged pea-sized lumps of bark from the stump, dipped them in the syrup, and gave the honey-coated pellets to his fledglings. He repeated this trick for many days, sometimes varying it by using grains or sunflower seeds which were in a hollow of the same stump. This was observed in the first half of July, 1947, at my home, 2 miles south of Globe, Arizona, at 3700 feet.

On January 6, 1947, a Ruby-crowned Kinglet (*Regulus calendula*) twitched about on a branch, so near that I glimpsed his white eye-ring and scarlet topknot. Suddenly he hovered over a flowering shrub amid a swarm of bees. Without alighting, he caught a bee in his bill, darted back to the tree, and with a quick flip of his head swallowed the bee entire. After repeating this stunt three times, he flew to a shallow, water-filled metate and took a bath.

While rain was falling gently on August 6, I spied a Broad-tailed Hummingbird (*Selasphorus platycercus*) in a cypress by my window, taking a shower bath with much fluttering and preening. When the rain came faster he edged toward the center of the tree, clamped his feet to a branch, and braced his body against the trunk. For a few minutes there was a deluge—a cascade such as is purposely braved by some hummingbirds. The bird now straightened up his body and pointed his beak

skyward. This position, exposing a slanting and smaller surface of sleek feathers, enabled him to take the impact without apparent difficulty.—ADA ANTEVS, *Globe, Arizona, November 17, 1947.*

A Mid-winter Record of the Barn Swallow in Lane County, Oregon.—Throughout the winter of 1946-47 a Burrowing Owl (*Speotyto cunicularia*) established residence under a low bridge along the highway near Meadowview about eight miles north of Eugene, Lane County, Oregon. During this period of time I was collecting owl pellets for analysis and made two collections from about this bird's roosting place.

The first collection of nine pellets was made on December 30, 1946. The second collection produced six newly cast pellets on February 9, 1947. Two of the pellets from the latter group contained the remains of a Barn Swallow (*Hirundo rustica*). Of these two pellets, one was entirely composed of swallow material and the other contained both swallow remains and the parts of a mouse of the genus *Peromyscus*.

Normally the Barn Swallow is found in this area from April until late September, but apparently this bird was in the area during January. The pellet analysis was made by Charles C. Sperry of the Denver Wildlife Research Laboratory of the United States Fish and Wildlife Service.—GORDON W. GULLION, *Eugene, Oregon, October 4, 1947.*

White-winged Junco Parasitized by Cowbird.—In the open pine woods of Powder River County in southeastern Montana, White-winged Juncos (*Junco aikeni*) breed commonly. In late June of 1947, 4 miles west of Fort Howes Ranger Station, near Otter, I found two nests of this species each sunk in foot-high grass at the edge of pine timber. The first nest of June 25 contained one cowbird egg, one junco egg and two recently hatched young. One of the young had dry black down and was evidently a young junco; the other, with nearly white down, was assumed to be a cowbird. In the second nest on June 28 were two young cowbirds about five days old and two junco eggs. The young cowbirds begged loudly for food before the adult junco reached the nest, thus nullifying the concealing effect of the cautious skulking approach of the foster parent.

Juncos as a group are not frequently parasitized by cowbirds. Friedmann (Auk, 60, 1943:350-356, and preceding literature there cited on host species) reports parasitism only of the Slate-colored Junco (*Junco hyemalis hyemalis*) and of one race of Oregon Junco (*Junco oreganus montanus*). The habitats of juncos and cowbirds are largely distinct and often are not adjacent. In the vicinity of Fort Howes Ranger Station there are open grassy lands and creek bottoms which the cowbirds frequent and which afford means of penetration of the forest habitat. Cowbirds were abundant and specimens proved to be of the race *Molothrus ater artemisiae*. Solitary Vireos (*Vireo solitarius plumbeus*) also were seen raising young cowbirds in the pine timber.—ALDEN H. MILLER, *Museum of Vertebrate Zoology, Berkeley, California, December 6, 1947.*

White-tailed Kites Roosting Together.—Due to the scarcity of the White-tailed Kite (*Elanus leucurus*) and to the fact that the bird seems to be gaining somewhat in numbers in southern California, the following records may be of interest. While serving as a member of the Marine Corps, I was stationed for over eight months at Camp Pendleton, Oceanside, California, and there I found the White-tailed Kite to be a fairly common bird. However, it was not until my duties took me to the rifle range every day that I discovered what an unusual concentration of kites this area possesses.

At Camp Pendleton the main rifle range is situated on the north side of the wide canyon which runs from the center of the base to the sea and down which flows the Santa Margarita River. This river has been dammed up a mile or so above the rifle range into a sizeable pond, and the overflow from this pond kept some water flowing into the river all the time I was there. Doubtless this was an important factor to the local bird and mammal populations.

I quote the following notes from my journal: "January 21, 1946: To the rifle range this morning shortly after dawn; in three dead trees grouped closely together near the river were perched six kites! January 22: Eleven kites just after dawn perched in the same group of dead willow trees; they frequent a large marshy-grassy area, sprinkled with small trees and large bushes. Several birds beautifully seen as they flew close overhead and hunted nearby. January 23: At the rifle range at dawn today with twenty-five kites perched in the same three trees, all in the field of my glass at one time! They

evidently all roost together, but as soon as the sun comes up they quickly disperse, leaving the usual six or eight birds which I've seen all week hunting in this area."

This concentration of twenty-five birds on January 23 was the largest number seen at any one time, although the birds continued to be present in varying numbers. On January 29 courtship flight was first observed. On February 22 I did not arrive at the "kite rookery," as I had come to call it, until 8:30 a.m., usually far too late in the morning to see any more than six or seven birds, but there were fourteen kites in the same three dead willows.

On March 3, I met Mr. and Mrs. Howard Cogswell and Mr. and Mrs. James Murdock of Los Angeles in Oceanside shortly after dawn in the driving rain to try to show them this concentration of kites. Due to the rain, the fact that we did not reach the range until well after sun-up (had it been visible), and also that the season was far advanced (the morning concentration had decreased steadily in the latter part of February), there were only two birds present at the usual spot. However, in the course of the day's observation in the vicinity we were able to find eleven kites. As I noted in my journal at the time, "they have evidently all spread out to breed, for we had to travel to every spot I knew of to find the eleven birds we saw."

On March 12 there were five pairs in the immediate vicinity of the winter roosting spot and three nests were found. Adult birds were observed sitting in them for long periods, leaving only when I approached closely and then showing considerable concern. I found it impossible to see into any of the nests and so I do not know definitely whether or not eggs had been laid. However, one pair of birds which I watched closely were seen to copulate twice within an hour.

I was transferred away from Camp Pendleton in the month of April, but upon my return in early May the kites evidently had young in the nest, as the adults were seen for the first time hunting regularly in the main area of the base, right among the barracks.—ALLEN H. MORGAN, *Hartford, Connecticut*, November 20, 1947.

The Eastern Brant in Idaho.—While Glen Bandelin of Sandpoint, Idaho, was in a blind with goose decoys before him at the southeast corner of Lake Pend O'Reille at the mouth of Clark's Fork River, Bonner County, Idaho, on October 7, 1947, a bird alighted among the decoys unnoticed by the hunter. It was there for an undetermined time and flushed only when the hunter became restless and moved about in the blind. A long shot brought the bird down.

Game Management Agent Edward T. Carter, in checking Bandelin's kill for the day, saw the bird and brought it to the attention of Webster H. Ransom of the Fish and Wildlife Service, who at once made an unsuccessful effort to secure the bird for a specimen. Ransom, however, did obtain the head and part of the neck, at the same time writing a complete description of the bird's plumage, which he illustrated with a pen line sketch. This sketch, with the head and neck, were presented to me early in November. To verify my identification of the bird as an Eastern Brant I sent all this evidence to Alden H. Miller, who examined the material and compared it with all the brant in the Museum of Vertebrate Zoology at Berkeley, California. In conclusion Dr. Miller wrote me under date of December 8, 1947: "The head thus seems perfectly typical of *Branta bernicla hrota*."

From Ransom's description of the feathers on the back and wings I believe the bird was immature. It was in poor flesh as is usual with the few brant I have examined taken far from salt water. Apparently a fresh water habitat does not furnish these salt water birds with a suitable diet to keep them in good flesh.

The only previous mention of any brant occurring in Idaho with which I am familiar is that of Davis (*Condor*, 37, 1935:234) who lists the Black Brant as a regular migrant. This occurrence is referred to by Arvey in "A Check List of the Birds of Idaho" (*Univ. Kansas Publ., Mus. Nat. Hist.*, 1, 1947:193-216). I know of no specimens to verify these reports.—STANLEY G. JEWETT, *Portland, Oregon*, January 2, 1948.

NOTES AND NEWS



Fig. 22. Rollo H. Beck of Planada, California, for many years a student and collector of birds, who has recently been elected to honorary membership in the Cooper Ornithological Club. He is perhaps best known for his important share in bringing together material and information on oceanic birds. A biographical account of Mr. Beck may be found in R. C. Murphy's "Oceanic Birds of South America."

The annual meeting of the Cooper Ornithological Club this year is to be held on May 7, 8 and 9 at Pacific Grove, on the Monterey Peninsula, California. Point Lobos State Park, the Hastings Reservation, and other points of ornithological interest are all within easy driving distance. The Committee for Arrangements and Program consists of J. M. Linsdale, Ferdinand S. Ruth, and Laidlaw Williams in the Monterey area, and A. H. Miller, F. A. Pitelka (chairman), and R. W. Storer at Berkeley. A call for papers will soon be mailed to members, who are urged to plan their contributions to the program without delay.

Perusal of the files of the *Ornithologist* and *Oologist*, *The Auk*, *Zoe*, *The Nidilogist* and per-

sonal letters brings to light some facts about the history of the ornithological urge that occurred in California just prior to the organization of the Cooper Ornithological Club.

An informal meeting was called of the ornithologists within reach of San Francisco, at the California Academy of Sciences, on January 19, 1889, by Mr. Walter E. Bryant, to band together for the mutual benefit of studying the little known habits of bird life in relation to the good instead of detriment to the agriculturist and horticulturist. Those present were W. E. Bryant, F. W. Andros, C. A. Kellar, T. S. Palmer, W. O. Emerson, R. H. Taylor, and Wm. Flint. A second meeting was called on February 9, 1889, and The California Ornithological Club was officially organized. The officers were: president, Walter E. Bryant; vice-president, Harry R. Taylor; secretary and treasurer, W. Otto Emerson. Another meeting was held on September 14 and D. A. Cohen was elected as a corresponding member.

The newly organized club did not seem to function regularly, for an February 10, 1891, we find that a reorganization meeting was held with the following in attendance: Bryant, Taylor, Johnson, Holmes, Keller, and Macdonald. H. R. Taylor was elected president, F. O. Johnson, vice-president, and C. A. Kellar, secretary and treasurer. Messrs. E. Carleton, Thurber, Bancroft and T. E. Slevin were proposed for active memberships. *Zoe* was made the official organ for publication.

I have been unable to locate any more records of meetings of this early ornithologically inclined group until they finally settled on the name Cooper Ornithological Club on June 22, 1893.—W. LEE CHAMBERS.

We have often wondered why there are many reports of "anting" behavior among birds of the eastern part of North America and few or none for western species. Are the birds, the ants, or the observers at fault? We suspect that one of the latter two differ critically in this regard. If there are geographic variables in this problem, their elucidation may help to establish the meaning of this behavior which thus far has proved baffling.

For a recent discussion of this subject, see Brackbill (*Auk*, 65, 1948:66-77).

Studies in recent years at Louisiana State University have demonstrated the practicability and desirability of making counts at night of migrating birds by use of a small telescope focused on the moon. The number of birds seen in this measurable portion of the sky furnishes an index to the total number passing over a given observation station. The telescopic method also provides a means of computing the direction and altitude of flight. From these data it will be eventually possible to determine to what extent night migrants follow set pathways, whether the flights are continuous in equal volume throughout the hours of darkness, and in what way certain meteorological conditions affect the density and direction of migration. However, large numbers of observations are necessary to obtain results of statistical significance. An intensive program of study in the spring of 1948 is being directed from Louisiana State University. Observation stations ranging from Florida to eastern Mexico and from the Yucatan Peninsula north to southern Michigan are already scheduled for operation. But many more such stations are urgently needed. Any Cooper Ornithological Club member with access to a spotting scope or a low-powered astronomical telescope who is willing to collaborate in this project, is asked to communicate immediately with George H. Lowery, Museum of Zoology, Louisiana State University, Baton Rouge, Louisiana. Detailed instructions and data sheets will be provided at once so as to permit observations in the full moon periods of April and May.

COOPER CLUB MEETINGS

NORTHERN DIVISION

OCTOBER.—The monthly meeting of the Northern Division of the Cooper Ornithological Club was held on Thursday, October 23, 1947, in Room 2503 Life Sciences Building, University of California, Berkeley, with 75 members and guests present. The following proposals for membership were read: Geil Anne Bartels, 2535 Piedmont Ave., Berkeley 4, Calif., Rose Brondz, 2247 Derby St., Berkeley 5, Calif., Henry E. Childs, 335 Pleasant St., Rumford 16, Rhode Island, Robert L. Eberhardt, 1111 High Court, Berkeley 8, Calif., Richard F. Shaw, 271 Colusa Ave., Berkeley 7, Calif., and Sidney J. Townsley, 2517 Parker St., Berkeley 4, Calif., by Henry E. Childs, Jr.; Louis

Locke, 2410 College Ave., Berkeley 4, Calif., by A. Starker Leopold; Adele M. Zimmerman, Museum of Vertebrate Zoology, University of California, Berkeley 4, Calif., by Susan E. Chattin; William J. Beecher, Chicago Natural History Museum, Chicago 5, Ill., and R. H. Gibson, R. R. 2, Box 336, St. Helena, Calif., by Frank A. Pitelka; A. Laurence Curl, 2715 Benvenue Ave., Berkeley 5, Calif., and Oliver Payne Pearson, Museum of Vertebrate Zoology, University of California, Berkeley 4, Calif., by Charles G. Sibley.

Mrs. Juneau W. Kelly, the speaker of the evening, reported on the 1947 migration at Rockport, Texas.—CHARLES G. SIBLEY, *Secretary*.

NOVEMBER.—The regular monthly meeting of the Northern Division of the Cooper Ornithological Club was held on Thursday, November 18, 1947, in Room 2503 Life Sciences Building, University of California, Berkeley, with 100 members and guests present. Proposals for membership were read as follows: Don C. Fisher, Lava Beds National Monument, Tulelake, Calif., and Andrew J. Meyerring, 119-30 146th St., South Ozone Park 20, Long Island, N.Y., by Alden H. Miller, and Eugene Eisenmann, 11 Broadway, New York 4, N.Y., by Frank A. Pitelka.

The speaker of the evening, Mr. Carl Eklund, Biologist, U.S. Fish and Wildlife Service, presented a movie of birds and other wildlife observed on the First Byrd Antarctic Expedition.—CHARLES G. SIBLEY, *Secretary*.

DECEMBER.—The regular monthly meeting of the Northern Division of the Cooper Ornithological Club was held on Thursday, December 18, 1947, in Room 2000 Life Sciences Building, University of California, Berkeley, with 175 members and guests present. Proposals for membership were read as follows: Mrs. Russell P. Hastings, 3525 Pacific Ave., San Francisco 18, by Hilda W. Grinnell; Laird M. Williams, 1710 Arch St., Berkeley 9, by Jean M. Nelson; Raymond E. Jessop, 2338 Haste St., Berkeley 4, Bruce F. Provin, 1814 Chestnut St., Oakland, and William McBlair, 2451 Church Lane, San Pablo, all in California, by R. R. Ronkin; Morgan Harris, 1212 Bancroft Way, Berkeley, Calif., by Frank A. Pitelka; Russell H. Pray, 662 Santa Rosa Ave., Berkeley 7, Margaret J. Milwain, 731 Alma Ave., Oakland 10, and Mrs. Charles A. Harris, Rt. 1, Box 100, Carmel, all in California, by Charles G. Sibley.

Mrs. Eric Reynolds, the speaker of the eve-

ning, presented another of her excellent movies, entitled "With Feathers Flying."—CHARLES G. SIBLEY, *Secretary*.

JANUARY.—The regular monthly meeting of the Northern Division of the Cooper Ornithological Club was held on Thursday, January 22, 1948, in Room 2503 Life Sciences Building, University of California, Berkeley. Proposals for membership were read as follows: Frederick Blunt, 1563 American Ave., Long Beach 13, Calif., by Alden H. Miller; Donald E. Isaac, 272 E. 4th Ave., Chico, Calif., by Thomas L. Rodgers; Seth Tilmon Bailey, 1424 Bay St., Alameda, Calif., by Henry E. Childs, Jr.; Henry Jensen, Box 112, Park River, North Dakota, and David S. Dewey, Isleton, Calif., by Frank A. Pitelka.

Officers of the Northern Division for 1948 were elected as follows: Frank A. Pitelka, president; Junea W. Kelly, vice-president; and Charles G. Sibley, secretary.

The speaker of the evening, Dr. Harvey I. Fisher, showed some excellent Kodachrome slides of the sea birds of the Hawaiian chain.—CHARLES G. SIBLEY, *Secretary*.

SOUTHERN DIVISION

OCTOBER.—The monthly meeting of the Southern Division of the Cooper Ornithological Club was held on October 28, 1947, in Room 145 Allan Hancock Foundation, University of Southern California, Los Angeles. The following names were proposed for membership: Paul M. Baldwin, Bakersfield College, Bakersfield, Calif., and Oakleigh Thorne II, Box 401, Millbrook, N.Y., by F. M. Erickson; H. E. Beebe, 1847 N. Wilcox, Hollywood 28, Calif., and Guy C. Caldwell, 7047 Hawthorn Ave., Hollywood 28, Calif., by C. V. Duff; Sidney Paul Gordon, Thatcher Hall, Oklahoma A. and M. College, Stillwater, Oklahoma, by Levon Lee; and Frederick N. Smith, 4330 Arlington Ave., Los Angeles 43, Calif., by Sid Platford.

Dr. Raymond B. Cowles, Professor of Zoology at the University of California at Los Angeles, spoke on "High Environmental Temperatures and What They May Mean to Animal Life."—DOROTHY E. GRONER, *Secretary*.

NOVEMBER.—The regular monthly meeting of the Southern Division of the Cooper Ornithological Club was held November 25, 1947, 145 Hancock Hall, University of Southern California, Los Angeles, with 35 members and guests present.

The following names were proposed for membership: William Ralph Fish, R. D. & T., Naval Ord. Test Sta., Inyokern, Calif., by K. E. Stager; Erle Stanley Gardner, Rancho del Paisano, Temecula, Calif., by J. R. Pemberton; Richard Linsley, 5550 Poplar Blvd., Los Angeles 32, Calif., by A. L. Berry; Louise A. Luckan, 4801 Ambrose Ave., Los Angeles 27, Calif., by C. V. Duff; Ralph Mall, 2306 Harcourt St., Los Angeles 16, Calif., by H. L. Cogswell; and Henri Cleret Seibert, Ohio University, Athens, Ohio, by J. McB. Robertson.

Dr. George H. Bartholomew, Jr., of the University of California at Los Angeles, gave a talk on "The Effects of Light on Reproduction in Birds."—DOROTHY E. GRONER, *Secretary*.

JANUARY.—The regular monthly meeting of the Southern Division of the Cooper Ornithological Club was held January 27, 1948, 145 Allan Hancock Hall, University of Southern California, Los Angeles, with 173 members and guests present. The following names were proposed for membership: Vernon Barrett, 714 W. Olympic Blvd., Los Angeles 15, Calif., by J. R. Pemberton; Kenneth Earl Darrow, 231 N. Main St., Three Rivers, Mich., by O. McK. Bryens; Minnie M. Smith, P. O. Box 452, Polson, Mont., by W. L. Chambers; James Hodges, 3132 Fair Ave., Davenport, Iowa, by J. McB. Robertson; Harlan Cosgrove, 5312 Overdale Dr., Los Angeles 43, Calif., and Ronald Milton Mock, 4247 Sutro Ave., Los Angeles 43, Calif., both by Adele Lewis Grant; Virginia E. Brown, Biology Dept., Marquette University, Milwaukee, Wisc.; Bruce Edwin Cardiff, R.F.D. 1, Rialto, Calif.; Alfred Owen Crompton, Lansic Ave., Salisbury, S. Australia; Elsie R. A. Cutcher, "Yarrabin," Croudace St., New Lambton, N.S.W., Australia; Kenneth S. Littlejohn, 5 de Mayo 10, Mexico, D.F.; Robert W. Metcalf, 2606 S.E. 81st Ave., Portland 6, Ore.; George Ferdinand Miller, Box 1065, Palm Springs, Calif.; Marie E. Terheggen, 5516 Rimpau Blvd., Los Angeles 43, Calif.; Blanch L. Unterkircher, 4537½ W. 11th Place, Los Angeles 6, Calif.; and O. B. Walker, Dingabiee, Mungindi, New South Wales, Australia, all by C. V. Duff.

Officers of the Southern Division for 1947 were re-elected, as follows: C. V. Duff, president; Kenneth E. Stager, vice-president; and Dorothy E. Groner, secretary.

Ed N. Harrison and Frances S. Roberts showed some of their beautiful pictures of the California Condor. Mr. Harrison related many of his personnel experiences with Condors.—DOROTHY E. GRONER, *Secretary*.

For Sale, Exchange and Want Column.—Each Cooper Club member is entitled to one advertising notice in any issue of The Condor free. Notices of over ten lines will be charged for at the rate of 15 cents per line. For this department, address JOHN MCB. ROBERTSON, Buena Park, California.

FOR SALE—Bendire's Life Histories of North American Birds, two volumes, 19 full-page lithographic plates, showing 385 eggs in natural color. Slightly used, in good condition for binding, \$7.00 per volume. Ridgway's Birds of North and Middle America, parts 1, 2, 3 and 4, 1901-1907, original paper covers, leaves uncut, \$3.00 per volume.—W. A. KENT, 815 Irolo St., Los Angeles 5, Calif.

FOR SALE—Complete set of Ridgway's Birds of North and Middle America, first two volumes paper, others bound. Make offer.—A. SIDNEY HYDE, 702 Parkman Ave., Los Angeles 26, Calif.

WANTED—Ridgway's Birds of North and Middle America, Parts 1, 9 and 10.—HENRY E. CHILDS, JR., 441 Boynton Ave., Berkeley 7, Calif.

FOR SALE—I have a complete set, 15 volumes, of my Life Histories of North American Birds, for which I am asking for bids. The first volume, Bull. 107, Diving Birds, is a Dodd, Mead and Co. reprint; the others are all in original paper covers and will be autographed.—A. C. BENT, Taunton, Mass.

FOR SALE—Dawson's Birds of California, four-volume set De Luxe edition with 110 color plates. Bound in two shades of buckram cloth, stamped in gold. A few sets left at \$75.00 per set postpaid in U.S.A. Originally purchased unbound from Lee Chambers who can attest quality.—DEVIN A. GARRITY, % The Devin-Adair Co., 23 East 26th St., New York 10, N.Y.

WILL BE MAILED ON REQUEST—Catalogue, just issued, of books and serials on ornithology and general natural history; chiefly from the libraries of William L. Finley and the late Harry S. Swarth and G. Frean Morcom.—F. N. BASSETT, 722 North Orange Drive, Los Angeles 38, Calif.

NEW SPRING BOOK CATALOGUE READY—Books on birds, mammals, wildlife conservation, game management, reptiles, fish, trees, flowers, insects, national parks, etc. "State" bird books our specialty. Catalogue sent on request.—FRED J. PIERCE, Winthrop, Iowa.

FOR EXCHANGE—Have collection of approximately 250 reprints in the field of herpetology, by Dunn, Barbour, Stejneger, etc. Wish to trade for similar collection of reprints in ornithology.—JOHN DAVIS, Museum of Vertebrate Zoology, Berkeley 4, Calif.

PREPARATION OF MANUSCRIPTS FOR THE CONDOR

Articles published in the Condor normally are written by members of the Cooper Ornithological Club. Practically all the Club's money goes into the magazine; no editor and no business manager receive any pay other than the satisfaction of doing a service worthily. The preparation of good copy by the author will contribute greatly to accuracy of published output, dispatch in handling, and economy of production.

To be acceptable for inclusion in the Condor, articles must not duplicate in any substantial way material that is published elsewhere. Any type of subject bearing on birds may be considered; but the geographic areas of primary concern are western North America, Central America, and the Pacific Basin. Manuscripts may be submitted to any one of the editors (see inside front cover for address). Proofs with edited manuscripts will be sent to authors, at which time reprints may be ordered.

In the interests of accuracy and economy, observe the following: do not duplicate data in text, tables, or charts; check citations to original sources and verify text references; quoted statements must be exact replicas of the original; preferably use vernacular names applicable to the entire avian species (for a guide in this regard, see "The Distribution of the Birds of California," *Pac. Coast Avif.* No. 27, 1944:5-34); in general, avoid subspecific vernaculars; insert scientific names for species but not the subspecific name except in taxonomic papers or where the race concerned has been critically determined by the author or his collaborators; revise the manuscript repeatedly to remove superfluous words and phrases, immaterial detail, and repetitious statements.

Note Condor style and usage. "General Articles" and the "Field and Study" items are set up in different form. Provide a concise, meaningful title, and, where needed, subtitles within the text. Footnotes are not used. The address line may serve to indicate institutional connection, and to it should be added the date of transmittal of the manuscript. Terminal bibliographies are desirable where five or more titles are to be cited; otherwise, the references may be included in the text. For bibliographic style, note closely the practices employed in recent volumes of the journal. A factual summary is recommended for longer papers.

Rules for copy.—(1) typewrite material, using one side of paper only; (2) double space *all* material and leave liberal margins; (3) use 8½ × 11 inch paper of standard weight (avoid onion skin); (4) carbon copies are not acceptable; (5) place tables on separate pages; (6) number pages in upper right hand corner.

Illustrations.—Photographs should be glossy prints of good contrast. Make line drawings with India ink; plan linework and lettering for at least ½ reduction; do not use typewritten labels on the face of the drawing. Provide typed legends on separate sheets.

Helpful references on writing: *Manual of Style*, University of Chicago Press, and *Rules of the Editorial Committee*, University of California Press. On scientific nomenclature: A.O.U. Check-list (with supplements 19, 20, 21 and 22) and *Pacific Coast Avifauna* No. 27; authors are not required to follow either of these works.

THE EDITORS OF THE CONDOR.

